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CENTRAL RAILROAD OF NEW JERSEY

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Railway Age

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How Vigilance Reduces Grade Crossing Accidents

EVIDENCE that grade crossing accidents are not necessarily unavoidable and that proper care on the part of drivers of highway vehicles will tend at least to reduce, if not eliminate, them, is contained in a recent report of the Railroad Commission of California. That part of the report relating to grade crossing accidents involving motor coaches is of particular interest and significance. In California, as in other states, motor coaches are required to stop at all grade crossings before proceeding over them. In other words, the drivers of motor coaches are compelled, by the enforcement of the law, to observe a rule of careful driving which applies to all other drivers as well, but is honored by them more in its breach than in its observance. The result of this requirement affecting motor coaches in California is strikingly defined in the commission's recent report. This report shows that during 1927 and 1928 there were no grade crossing accidents involving motor coaches in which there were any fatalities. Furthermore, the report states that the number of motor coach passengers injured in grade crossing accidents was reduced from 14 in 1927 to 1 in 1928. The deplorable toll of lives exacted by grade crossing accidents each year would be greatly reduced and perhaps almost eliminated if all drivers of motor vehicles were compelled to observe the rules of common sense in crossing tracks at grade as motor coach operators are required to observe them.

Terminal Operating Committees

CO-OPERATION in terminal operation by means of joint operating committees continues to be successful. The annual report of the Cincinnati Operating Committee for 1928 shows that only 521 transfer orders were issued in that terminal during the year, as compared with 733 in 1927, and 10,935 in 1923. The Over and Short Bureau, maintained under the auspices of the committee, succeeded in matching 1,549 shipments, thus eliminating that number of claims and complaints from shippers and consignees. The Smoke Inspection Bureau had an active and progressive year, and all the other manifold activities of the committee were similarly successful. This proves again the value of such committees in terminal operation. From attitudes of more or less mutual distrust, the lines entering the terminal are brought to an attitude of co-operation, by means of this sort of a neutral agency overseeing the terminal operations in general. Discrepancies and inconsistencies of all sorts, and in many departments, are ironed out, and economies and better service are effected. While committees of this sort are particularly effective in dealing with the problems

of such complex terminals as those in Cincinnati and Cleveland, it is the claim of their adherents that they would be equally successful in any terminal, a claim which would seem to be justified.

Equipment Repairs Concentrated

THE general trend in equipment maintenance at present and for some time past has been toward the concentration of locomotive and car repair work at shops furnished with the modern machinery, tools and labor-saving equipment necessary for the efficient handling of the great volume of repair operations involved. Smaller intermediate repair shop forces have been greatly reduced, or in some cases, cut out altogether, with large attendant savings. The advantages of concentration of equipment repairs at modern shops where efficient production methods are applicable is strikingly illustrated in the case of the Pennsylvania, which, according to a recent news release, made a saving of more than ten million dollars in maintenance of equipment expenditures in 1928, while at the same time effecting an actual improvement in equipment condition. The comparative condition figures indicate that 95.4 per cent of the Pennsylvania locomotives were in good working order at the close of 1928, as compared with 95.0 per cent in 1927. In the case of passenger-train cars, 98.6 per cent were in good order, as compared with 97.3 per cent the previous year. Freight cars also showed an improvement, 93.8 per cent being in serviceable condition at the close of 1928, as compared with 93.2 per cent in 1927. Many other roads have made substantial savings by studying their equipment maintenance work as a whole from a system standpoint, segregating repairs of various classes of equipment at strategic points and setting up improvement programs to provide as rapidly as practicable the modern machinery, equipment and methods for the efficient handling of this work.

An Unexpected Reduction In Car Equipment Failures

THE number of draws-bars pulled out by the stopping and starting of heavy freight trains to enter or leave passing tracks can be reduced by using power switch machines with signals to direct train movements under the control of one man at a central point on a division. However, in making estimates of the savings to be accomplished by proposed installations of such centralized dispatching systems, the reduction of draw-bar failures and broken couplers has been considered as one of the intangible benefits that is difficult to evaluate. It is, therefore, illuminating to note that

the Ohio Central Lines of the New York Central have taken the trouble to compile a record of such equipment failures on the 40 miles of single-track territory from Berwick, Ohio, to Stanley, where the centralized dispatcher system is used. In 1927, prior to the use of the control system with power switches, there were 43 equipment failures in this territory, whereas there were only 12 such failures in 1928, or a reduction of 72 per cent. J. J. Brinkworth, superintendent of this division, in discussing this subject before the convention of the Signal Section, A. R. A., recently, stated that about 70 per cent of the meets were being made on this single-track territory without either train being required to stop. The reduction of 31 car-equipment failures on this 40 miles of line in one year not only reduced the car repair charges materially, but also eliminated the possibility of serious delays in train operation on 31 occasions, because a draw-bar failure quite often ties up the main line for 45 minutes or more, which on a busy single-track line may aggregate several hours of delay when considering all of the trains involved. Where adverse grades result in an unusual number of equipment failures and delays at passing tracks, but where the conditions do not warrant the installation of the centralized dispatcher system, the same improvement can be effected by equipping these individual isolated switches with power machines, controlled remotely from the nearest interlocking or telegraph office.

What Is "Rationalization"?

THE use of words to convey meaning rather than to conceal it, a purpose expressed by one of the candidates in the campaign last fall, is the first requirement for any understandable discussion of a technical subject. Unfortunately, words themselves often contrive to make the achievement of this end rather difficult. An important instance of such a difficulty appears in the word "rationalization." This word primarily, of course, means nothing more than making rational or reasonable. Some years ago, however, the psychologists adopted the term and gave it a special meaning of their own, i.e., the attempt to assign reasons *ex post facto* for an act or a point of view which actually was previously determined by processes into which reason did not enter. The man born and bred in one political faith and who never departs from it can usually give just as many "reasons" for his point of view as can the convert to the same political opinion. In the former case, however, the opinion comes first and the "reasons" follow. This is "rationalization" in the terminology of psychology.

Now European industries have added to the confusion by giving us another meaning for "rationalization." By it they mean more or less what we do by such terms as scientific management and organization. If a railroad ceases to function entirely by force of habit; if it examines its operations critically, finds their flaws and reorganizes its processes, in the light of its studies, to improve its efficiency—that is "rationalization." It is a word and an idea which has achieved enormous popularity in Europe in the past few years. Entire industries are "rationalizing" their own operations, and are joining with other industries to "rationalize" industry as a whole. What this rationalization consists of from a railroad standpoint and how it differs from previous practices is set forth on another page of this issue in an article on the German Railroad Company by Professor

Weidenhammer of the University of Minnesota. Railroad men of this continent will recognize in this "rationalization" a process which has been going on over here for many years without the necessity having arisen to invent a new word to describe it. What then is meant by rationalization?—it depends upon whether the user of the term is a psychologist or an engineer.

The Busy Tax-Gatherer

THE taxes of the railways were nine per cent greater in January than in the same month of last year, which shows that the tax-gatherers of the country are still engaged in doing all they can to maintain or increase what the public must pay for railway transportation. The need for constantly calling the attention of the public to the tendency of railway taxes is due to the facts that, first, taxes are constantly increasing, and, secondly, they are the one large factor in the cost of railway transportation over which the public has complete control and over which, in consequence, the managements of the railways have no control.

There is constant pressure from the public for cheaper transportation. How the public uses its power to increase the cost of railway transportation, while the managements of the railways are making the greatest practicable efforts to reduce it, is illustrated by the difference between the trends of operating expenses and of taxes during recent years. Between 1923 and 1928 the operating expenses of the railways were reduced \$473,000,000, or about 9 per cent. Between the same years their taxes were increased from \$332,000,000 to \$389,000,000, or more than 17 per cent. After having declined slightly in 1927, railway taxes again increased in 1928, and made a new high record.

Many persons know that the taxes of the railways have steadily increased more in proportion than their total earnings. How many realize that, in spite of the large advances that have occurred in wages and other operating costs, the taxes of the railways have increased much more in proportion than either their total operating expenses or the total wages paid by them to their employees?

In 1903 the railways paid only \$1 in taxes for each \$36 of total earnings collected by them. In 1913, the year before the war in Europe began, they paid \$1 in taxes for each \$26 of earnings collected by them. In 1923 they paid \$1 in taxes for each \$19 of total earnings, and in 1928 their taxes amounted to \$1 for each \$15.68 of total earnings.

In 1903 the railways paid \$1 in taxes for each \$24 of operating expense incurred by them. In 1913 the ratio was \$1 in taxes to each \$18 of operating expenses; in 1923, \$1 in taxes to each \$14.75 of operating expenses, and in 1928, \$1 in taxes to each \$11.36 of operating expenses.

In 1903 the railways paid \$1 in taxes for each \$14 of wages paid by them. In 1913, the ratio was \$1 in taxes to each \$11 of wages; in 1923 it was \$1 in taxes to each \$9 of wages, and in 1928 it was \$1 in taxes to each \$7.25 of wages.

The ratios of taxes to total earnings, to operating expenses and to wages were all the highest in 1928 that they ever were in history.

In 1903 the net operating income earned by the railways was 11 times as great as the amount of taxes they paid. In 1913 their net operating income was almost 7

times as great as their taxes. In 1928 their net operating income was only 3 times as great as their taxes. The LaFollette valuation law was passed in 1913. Our policy of regulation long has had the strictest practicable limitation of the net operating income of the railways as its principal objective, and the LaFollette law was passed mainly to provide a measure for determining how much net operating income the railways should be allowed to earn. It is a significant fact that since the LaFollette law has been in effect the taxes of the railways have increased from one-seventh to one-third as much as the net operating income they are allowed to earn with which to pay a return upon the entire investment in their properties. The desire of government authorities to restrict the net return earned by the railways has been equalled only by their eagerness to increase the taxes imposed upon them.

Doubtless the taxes of many other industries have increased as rapidly in proportion as those of the railways. There is not, however, the same constant demand from the public for reductions in the charges of other industries as for reductions in the charges of the railways. When will the public begin to realize its inconsistency in incessantly seeking reductions in railway charges and at the same time allowing its taxing authorities constantly to increase the amount of taxes collected from the railways?

An Unwarranted Sense of Security

FOR nearly 20 years the transverse fissure has been recognized as a rail defect which threatens safety of travel. Engineers have given it much study and for more than two years attention has been focused on the development of the detector car as an agency for the location of this defect. This car has offered the one promise of security from this type of failure, which has constituted a particularly serious threat because of its widespread prevalence and the inability to detect it prior to fracture of the rail.

Before the machine was perfected there was much conjecture as to the number of fissures that would be found, some forecasting that they would be exceedingly few, while others feared that they would be so prevalent as to crowd the steel mills with emergency orders for replacement rails. Since the car has been completed and placed in actual service there has been an interesting and somewhat surprising change in attitude. Two of these cars have covered short sections of tracks, aggregating some 2,000 miles on a number of railways during the last five months. They have shown a frequency of fissures ranging from less than one per hundred miles of track to more than one per mile. They have demonstrated that no road is immune. Yet the reaction among railway men has been one of relief that their worst fears have not been realized and anxiety has given way to a complacency that is not warranted by the facts.

To date the mileage covered by the cars is a negligible proportion of the total main-line trackage of the country. In the rest of this trackage all of the fissures that were formerly there are still there and the hazard to travel is as great as before. Within the last week there have come to our desk two reports of the Bureau of Safety of the Interstate Commerce Commission on

train accidents caused by transverse fissures in rails which involved loss of life. The menace is, therefore, still before us.

It is true that the transverse fissure detector device is new. It is also true that it will undoubtedly undergo improvement as greater experience is gained. At the same time, it has already demonstrated its ability to detect and to locate fissures with certainty. It would appear, therefore, that railways which unnecessarily postpone the use of this device will be taking unnecessary risks.

Consolidation Policy

THE developments that have occurred in consequence of the passage of the consolidation provisions of the Transportation act afford a striking illustration of the futility of trying to solve economic problems by the adoption of ill-considered and artificial legislative measures. These provisions have now been in effect more than nine years. It is debatable whether they have stimulated or hindered consolidations. There always has been a natural tendency toward consolidations. Even if the consolidation provisions had not been passed, some consolidations undoubtedly would have been effected during the last nine years, unless prevented by the invoking of the Sherman anti-trust law by the Department of Justice. The principal author of the consolidation provisions was the late Senator Cummins of Iowa. They have completely failed to fulfill his expectations that within a comparatively few years they would cause practically all the railways to be combined into a comparatively small number of large systems.

The failure of the consolidation provisions has been due to lack of consideration by their authors of the actual conditions and problems with which they were intended to deal, and to consequent fundamental defects in the provisions themselves. For many years it had been the government's policy, as expressed in the anti-pooling section of the Act to Regulate Commerce and the Sherman anti-trust act, to prevent all agreements or combinations among railways that would restrict competition. The authors of the Transportation act suddenly decided that extensive consolidations of railways were desirable. Apparently they were influenced in reaching this conclusion chiefly by the fact that in every territory there were some so-called "strong" and some so-called "weak" roads, and by the belief that consolidation of these "strong" and "weak" roads would help to solve the problem of rate regulation presented by the competition with each other of railways with unequal earnings capacities which had to charge the same rates. They assumed that needed railway service could be provided with lower rates if the weak and strong roads were combined than if they continued to exist under separate ownership and management. This assumption was based on another assumption, namely, that the total net operating income needed by the railways would be less if the weak and strong roads were combined. They also believed that consolidations would make possible very large economies in operation. In order to make sure that consolidations would be carried out mainly or entirely with a view to promoting the public interest, they provided that the Interstate Commerce Commission should proceed at once to adopt a general plan of consolidations, and that the consolidations affected must conform to this plan.

This scheme, as experience has demonstrated, was unworkable. One of its principal shortcomings was that it threw very little light on what Congress intended that the Interstate Commerce Commission should consider to be in the public interest. It contemplated that consolidations should be effected in every part of the country, but that, at the same time, competition, at least in service, should be maintained, and that existing channels of commerce should be preserved. It should have been obvious, however, that no general plan of consolidations could be carried out without reducing competition. How much competition, then, was it intended should be maintained?

The reports made by the commission in various consolidation proceedings have indicated that a majority of its members are adverse to any substantial reduction in the number of railways competing for the traffic of any territory. After we have had the consolidation provisions for nine years it may safely be said that nobody yet knows how much and what kinds of competition the commission believes should be preserved in order to comply with them. Where the union of a weak and a strong road will obviously reduce competition should greater weight be given to the supposed advantages of combining weak and strong roads or to the supposed advantages of maintaining competition?

The Interstate Commerce Commission has definitely and repeatedly expressed the opinion that it is impracticable for it to formulate a satisfactory general plan for the consolidation of all the railways into a limited number of systems. The reasons for this are fairly obvious. The determination of whether any particular consolidation of a number of railways into a huge system should be permitted requires prolonged hearings and a vast amount of study. The hearings and study that would be pre-requisite to the formulation of a general plan of consolidations would be practically interminable. Therefore, to leave in effect the requirement that the adoption of a satisfactory general plan shall precede the actual effecting of consolidations would be to make it practically impossible to carry out a policy of consolidations.

It is evident that if a policy of consolidations is to be carried out an entirely new start in that direction must be made by radically changing the legislation providing for it. The requirement that the commission shall adopt a general plan must be repealed. Consolidations must be left to the voluntary initiative of the railways, subject to the approval of the Interstate Commerce Commission. There must be given a clear indication either by Congress or the Interstate Commerce Commission as to the principles to which the government believes a consolidation must conform in order to make it in accordance with the public interest.

It is natural and inevitable that railway financiers and executives will try to secure approval of plans which they believe will be advantageous to those that they especially represent. They cannot be justly criticized for this because it is their duty to protect and promote the interests of those who have entrusted property to their management, and it is easily conceivable by anybody, excepting those who are strongly prejudiced against the railways, that a consolidation may be beneficial both to the railways directly concerned and to the public. In fact it may be seriously questioned whether any consolidation that would be harmful to the railways concerned could be forced upon them, or, if this were done, that it would ever be beneficial to the public.

There have been many consolidations of railways ef-

fected in the United States—most of them before the Transportation act was adopted. They have usually been the natural result of evolution and of the application of sound business principles. It is not necessary, in order to promote consolidations that will be in the public interest, for the government to formulate artificial plans and try to secure their adoption by the artificial pressure of statutory provisions. If Congress will pass a law abolishing all the law-made obstacles to consolidations, but leaving consolidations subject to approval by the Interstate Commerce Commission, and if Congress or the commission will clearly indicate the standards that will be applied in determining whether proposed consolidations are in the public interest, we will probably soon begin to see consolidations effected which will be in the interest of both the railways and the public. The need for legislation of this general character is clearly shown by the experience of the last nine years.

Savings from Reclamation

DISCUSSIONS of reclamation which purport to reveal the accomplishments in this direction have usually been open to the criticism of repeatedly raising the question of what reclamation is and what the savings are, without seeming to have progressed very far in settling it. Committees decide and conventions recommend, but experts neither picture the work in the same way nor agree on the manner of computing its results. Thus, a road with a "reclamation" plant often visualizes its production as reclamation and everything else as something different, although the reclamation plant may include operations identical with those conducted elsewhere on the property.

Again, some distinguish reclamation from recovery, and it is argued also that anything which in the process is converted from the original form into another falls into the category of manufacturing, while disagreement is pronounced over attempts to isolate reclamation from repairs and over methods of figuring the cost and determining the saving. Is it reclamation to put a new handle on a track shovel or to weld a frog, or does it depend upon who does it, where and when? Is the price of a new brake beam saved when a new head is applied to one found in scrap, and should it be issued to users at the price of a new article or at the cost of its repair? These are some of the questions which have caused controversy in the past and that arise on every occasion when the work and savings of reclamation are given prominence. The situation created by this obvious lack of uniformity in viewpoint and practice is unfortunate.

Some time ago a committee of the American Railway Association solicited various railroads for reports of their savings from reclamation. The figures were received and an imposing total developed, but the irregularity in the reports from various roads was so pronounced that it was "deemed advisable" by the compilers not to reveal them, with the result that out of fear of its proving misleading, no benefit came from the compilation. What is the remedy? Is it to quash every report on reclamation because there is no agreement as to what reclamation is and what the savings are? Is it not better that those interested in reclamation should remove the causes of disagreement by reconciling this lack of uniformity in definition and practice?

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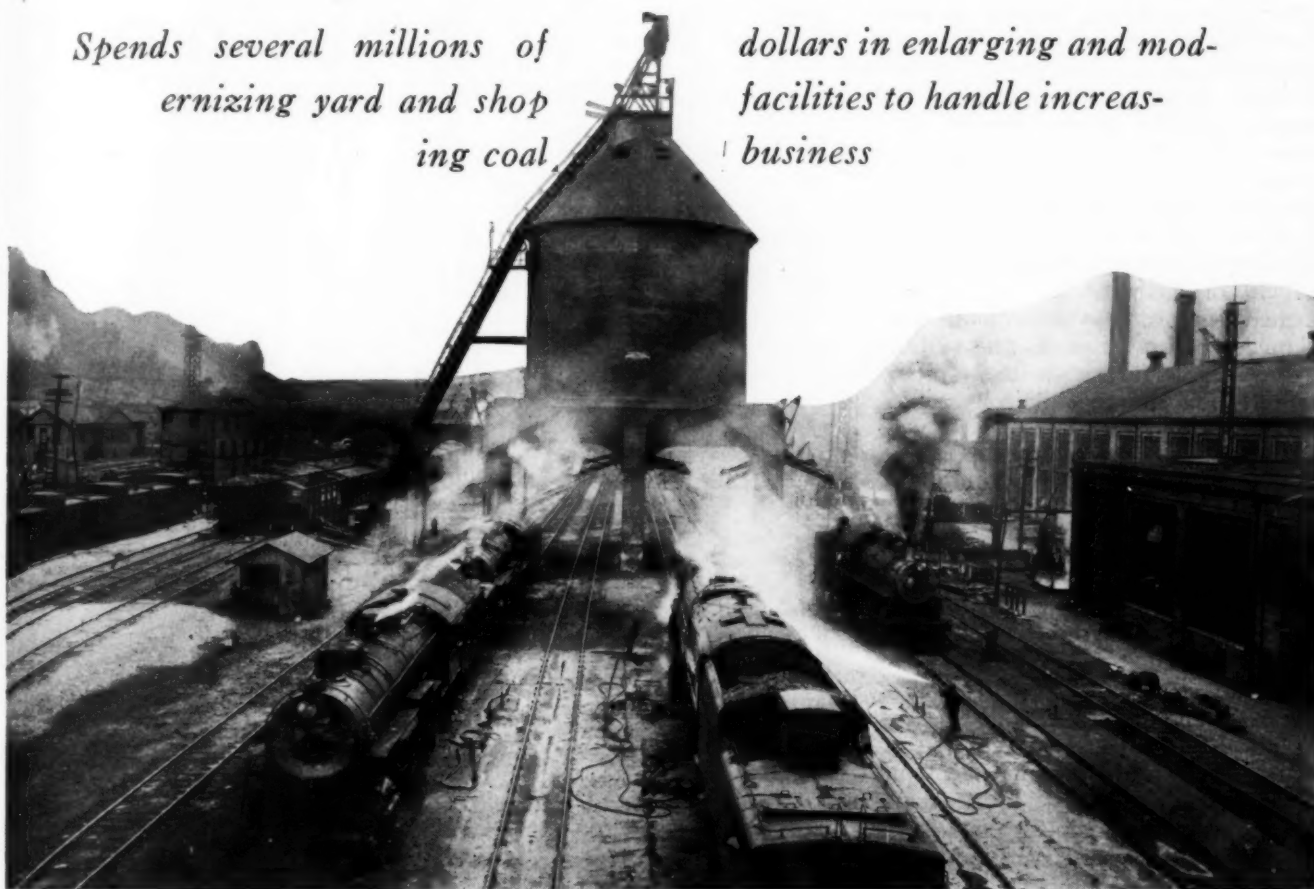
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N. & W. Completes Improvements at Portsmouth, Ohio

*Spends several millions of
ernizing yard and shop
ing coal*

*dollars in enlarging and mod-
facilities to handle increas-
business*



Looking Over the Leads to the Enginehouse—Engine-Washing Platform and Coaling Station in the Center and Shop Facilities at the Right

IN a program of improvements which has extended over the last ten years, and more particularly over the last five years, the Norfolk & Western has rebuilt and enlarged practically every unit of its extensive yard and engine terminal facilities at Portsmouth, Ohio. These improvements, which have cost several million dollars, include new car and locomotive shop buildings and engine terminal facilities, and the rearrangement and construction of tracks sufficient practically to double the capacity of the terminal, while greatly expediting the movement of cars and the turning of locomotives. So extensive are the improvements which have been made that it is beyond the scope of this article to do more than outline the work accomplished and to touch briefly upon the more important phases of it.

Large Improvements Planned in 1925

The history of the Portsmouth terminal has been one of steady expansion, particularly during the last ten years, owing to the increased development of westbound coal traffic from the Virginia, West Virginia and Kentucky coal fields. In 1919, an extensive study was started to ascertain what could be done to enlarge the terminal facilities to keep pace with the continually increasing traffic and size of power operated. In that year certain track changes were made, and 15 stalls on

the north half of the old 40-stall enginehouse were lengthened.

It was not until early in 1925, however that work was started on the comprehensive improvement program. From that time until late last year, the Portsmouth terminal has been the scene of constant construction activity. Some of the more important yard work included the placing of approximately 1½ million cubic yards of fill and the laying of about 58 miles of tracks and 201 turnouts, and the construction of a coach repair yard of 30-car capacity, a loaded car repair yard of 126-car capacity, a heavy car repair yard of 290-car capacity and a light car repair yard of 175-car capacity. Incidental to this yard work was the enlarging of the westbound classification hump yard, equipping it with two automatic motion weighing scales, car retarders, color-light humping signals, teletype printers, pneumatic tubes and a complete installation of floodlights.

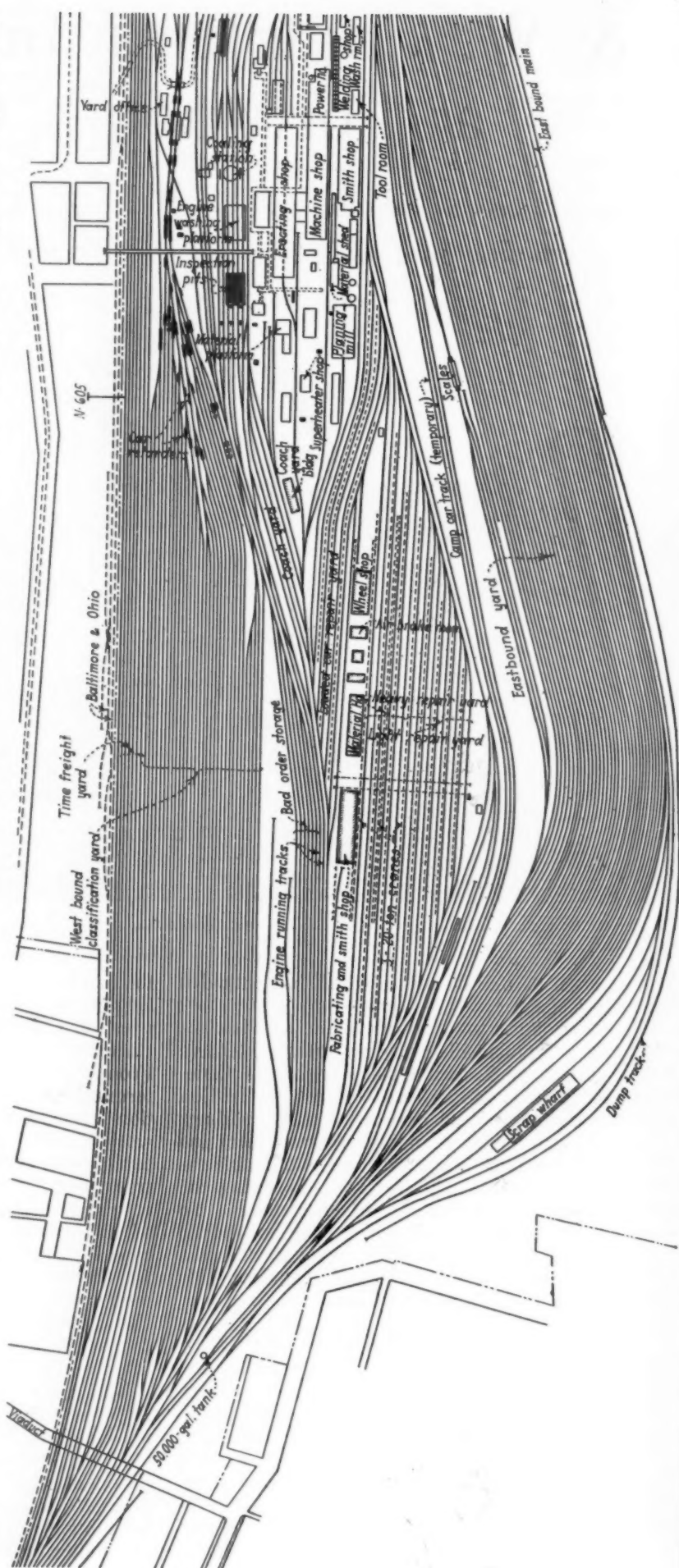
The more important new shop and engine terminal facilities include a 21-stall enginehouse, an enginehouse machine shop, a 25-ft. extension to the south side of the old 40-stall enginehouse, a four-story motive power department office building, a two-story storehouse, an enginemen's report building, large extensions to both the locomotive machine shop and the blacksmith shop, the rebuilding of the walls of the erecting shop, enlarged

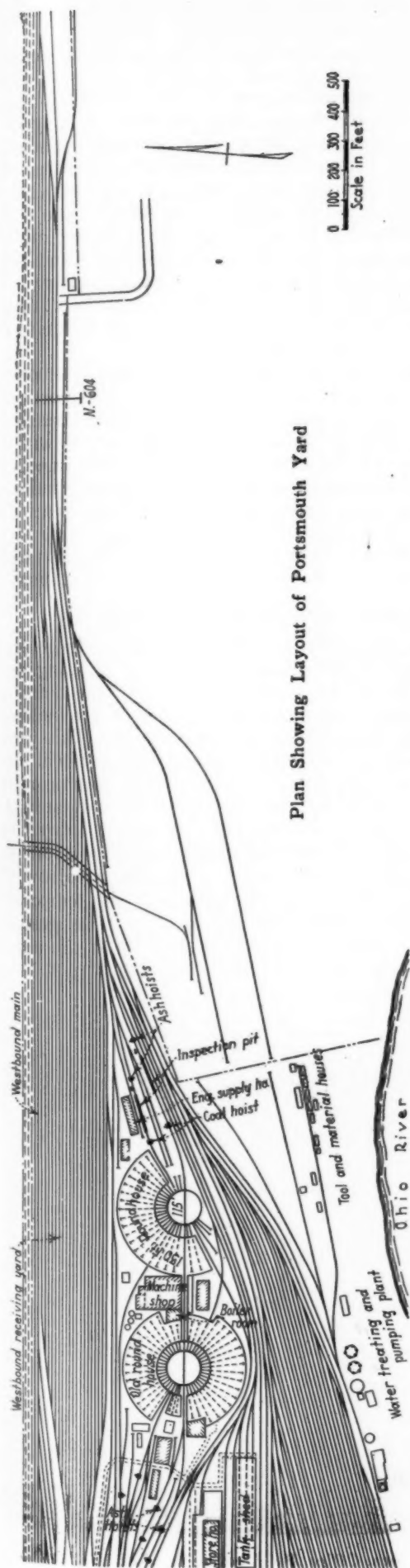
equipment in the power plant, a 2,000-ton reinforced concrete coaling station, two single-track N. & W.-type mechanical coaling plants, eight inspection pits on the enginehouse leads, a four-track locomotive washing platform, eight N. & W.-type mechanical ash hoists, and an extensive enlargement and rearrangement of the water supply facilities. Other new shop and terminal facilities include an electrical supply building, a roundhouse foreman's office building, an arch brick house, a pipe and tin shop, two enginemen's supply houses, new icing facilities and three wash and locker buildings. All of these facilities, which for the most part are of permanent fireproof construction, were planned and built so as to cause a minimum of interference with the operation of the terminal while construction was under way.

Terminal Practically Doubled

The Portsmouth terminal is one of the two largest terminals on the Norfolk & Western, the other being at Williamson, W. Va., which in recent years has also undergone an extensive program of enlargement and improvement, as described in the May 12, 1928 issue of the *Railway Age*. While the Williamson terminal is designed specifically as an assembling and forwarding point for coal received from the various mines in the Kentucky and West Virginia territories, the Portsmouth terminal, which is about 114 miles to the west, is designed primarily for receiving, billing, weighing and classifying this coal for movement to the great lakes ports and the West, thereby relieving the burden which has been placed on the two western termini of the road, Columbus and Cincinnati, Ohio.

The Portsmouth terminal lies in a general east and west direction, and, being confined by high hills on the north, the most practical way to enlarge the terminal area was on the south side, in spite of the fact that it involved the purchase of a large section of property and extensive grading operations. Practically the entire southwest side of the terminal area was widened out, requiring filling to an average depth of about 15 ft., and involving the handling of approximately 1½ million cubic yards of material. Most of this material was secured from the hills on the north side and was conveyed across a city street and the tracks at the west end of the yards by work trains, which operated over a temporary timber trestle about 2,000 ft. in length. A good concep-





Plan Showing Layout of Portsmouth Yard

tion of the extent of the yard enlargement work at Portsmouth is gained through the fact that the terminal area has been increased from about 140 acres to approximately 270 acres, and the further fact that the trackage has been increased by about 58 miles.

Westbound Receiving Yard Enlarged

As enlarged, the Portsmouth terminal area is approximately four miles long by over one-third of a mile wide at its broadest point. By reference to the accompanying plan, a clear understanding will be gained of the general layout of the facilities, which, in the main, provide westbound yard facilities on the north side, and eastbound yard facilities on the south side, with the shop and engine terminal facilities between them.

The westbound receiving yard, which consists of 19 tracks, extends west for about 4,000 ft. along the north side of the terminal area, the only tracks north of this yard being the westbound passenger main and an engine and switching lead. This yard, which receives all westbound coal trains requiring weighing and classification, was lengthened to increase its capacity from 576 cars to 1,320 cars, precluding the necessity, which has existed heretofore, for cutting long trains in two in order to get them into the yard.

In spite of the enlargement of this yard, the receiving tracks would not at all times accommodate all of the trains arriving from the east. To overcome this condition, five new pull-in tracks were constructed immediately east of the yard to avoid blocking the main line. The construction of these tracks, which accommodate from 80 to 124 cars each, involved the placing of about 350,000 cu. yd. of fill in widening the main line embankment, the shifting of about 12,000 ft. of tracks, and the construction of approximately 30,000 ft. of new tracks and 22 turnouts. In this improvement, the eastbound main track was shifted to the outside of the embankment next to the Ohio river, providing space between it and the westbound main for the new pull-in tracks.

Westbound Classification Yard Modernized

All of the trains, upon arrival in the westbound receiving yard, are pushed over a two-track hump, located approximately at the mid-way point of the terminal, where the loaded cars are weighed and then allowed to roll by gravity into the various tracks of the westbound classification yard immediately beyond. The arrangement permits cars to be humped, weighed and classified on both hump tracks at once, the tracks being entirely independent, except for crossovers, and each track being equipped with a 300-ton scale for motion weighing. Just ahead of the crest of the hump, and again just beyond the duplicate scale installation, the hump tracks are joined through two-way crossovers, so that when only one train is being humped at a time, cars from any track in the receiving yard can be humped to any of the tracks of the classification yard. In addition to the greater flexibility of operation which this arrangement provides, it also makes it possible to route all cars over one scale if the other should be under adjustment or out of order.

The enlarging and modernizing of the westbound classification yard at Portsmouth was one of the most important features of the work undertaken at that point. This involved the rearrangement, regrading and lengthening of existing tracks, the addition of ten new classification tracks and the complete equipping of these tracks with electro-pneumatic car retarders, direct-acting electro-pneumatic switch-operating machines, loud speakers, and position-light humping and trimmer signals. Floodlights, on 110-ft. towers, have been installed over the entire yard area for a distance of three miles. All of this equipment, with the exception of the floodlights, was described in the June 16, 1928, issue of the *Railway Age*.

The old westbound classification yard consisted of 21 tracks with a total capacity of about 1,300 cars, the longest track holding about 70 cars. As rearranged and enlarged, the yard now

has 37 tracks, 30 of which are set aside for the classification of coal cars for forwarding in trains, 6 for bad-order cars and 1 for cabooses. With these enlarged facilities, it is possible to handle approximately 4,000 cars over the hump and through the yard daily.

The classification tracks in this yard are divided into two distinct units, each being served by both of the hump tracks. Furthermore, each of the main groups is provided with a main ladder and with sub-ladders to reduce the size of the retarder installation necessary and to shorten the distance and time necessary for cars to get into the clear.

New Car Repair Facilities

Six bad-order car tracks lie south of the classification tracks and are separated from them by a space of sufficient width to permit the construction of ten additional classification tracks at some future time. Directly beyond the bad-order tracks to the south are the new car repair facilities at the terminal, which, for the most part, were constructed in an area which required extensive filling. These consist of a four-track coach repair yard, a seven-track loaded car repair yard, a six-track heavy repair yard, and a ten-track light repair yard. All of these repair yards are located in close proximity to the bad-order car storage tracks of the westbound classification yard, so that a minimum of switching is necessary in placing cars on any of the repair tracks.

In connection with the new car repair yards, practically an entirely new layout of car repair department buildings has been provided. The freight car repair units are located between the loaded car repair yard and the heavy car repair yard, in an area about 100 ft. wide and over 1,500 ft. long. These new facilities consist of a material house, a blacksmith and fabricating shop, a wheel shop, an air brake shop, an oil and paint house, a car foreman's office, and wash and locker buildings equipped with wash fountains, shower baths and metal lockers. Practically all of these buildings, with the exception of those used for office purposes, as well as other relatively small new buildings of a similar

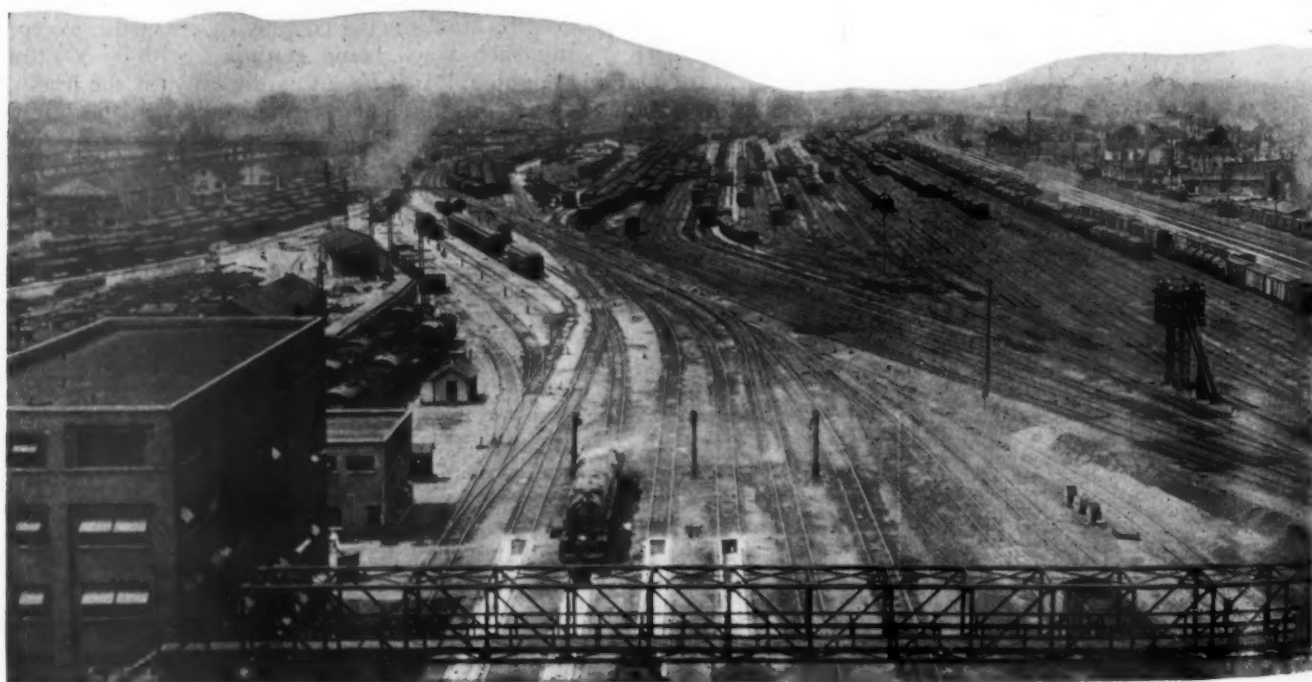
class about the terminal, are of sheet-metal construction on concrete foundations.

One of the special features of the freight car repair yards is the crane equipment provided. This includes an overhead crane runway with a 10-ton traveling crane at the west end of the car shop facilities, serving the smith and fabricating shops; a similar craneway equipped with a 5-ton traveling crane serving the wheel shop and wheel storage area at the east end of the car shop facilities; a 10-ton overhead traveling crane with a runway about 430 ft. in length which crosses all 16 tracks of the heavy and light-repair yards; and two parallel longitudinal craneways in the heavy repair yard, each with a length of about 1,500 ft. Each of these latter craneways spans three tracks and each is equipped with three 20-ton traveling cranes.

In addition to the main yards for handling westbound traffic, there is an additional westbound yard north of and parallel with the receiving and westbound classification yards. This yard, which has five tracks with a total capacity of 555 cars, is used solely for handling westbound time-freight trains. As there is relatively little breaking up of trains in this yard, other than what is necessary in adding cars to through trains, this yard is relatively flat except for a slight grade at the east end, which was provided to assist flat-switching operations.

Eastbound Yard Enlarged Extensively

While the work thus far described was of large proportions, by far the greatest amount of grading and trackwork was in the southwest section of the terminal along the Ohio river, in connection with the rebuilding and enlarging of the main eastbound yard. This yard, which is used for making up trains of empty coal cars and for classifying time-freight trains in station order for destinations as far east as Roanoke, is located almost entirely on a new fill with an average depth of 15 ft. In making this fill, approximately a million yards of earth and rock were hauled from a borrow pit on the north side of the terminal, over the temporary timber trestle mentioned previously. This grading work, which extended over a period of about two years,



Looking West Over the Classification Yard—The Motive Power Office Building at the Left

was carried out without serious difficulty and without delay or interference to operation in any of the yards.

Enlarging and lengthening the eastbound and westbound classification yards necessitated the installation of a long twin-pipe culvert to carry the water from an old box culvert in the westbound classification yard, under the new yard tracks. This culvert, which is about 1,000 ft. long, consists of two lines of Massey reinforced concrete pipe, each with a horizontal diameter of 84 in. and a vertical diameter of 90 in.

As rebuilt, the new eastbound yard has 30 tracks with a total capacity of 3,180 cars, an increase of about 790 cars. In addition, space has been provided in this yard for ten additional tracks with a total capacity of 625 cars. Aside from the heavy grading necessary in enlarging the eastbound yard, the work involved the shifting of several thousand feet of old tracks, the laying of about 32 miles of new tracks and the installation of 98 turnouts.

The new eastbound main for passenger trains is located on the extreme south side of the eastbound yard, following along the top of the new embankment abutting the Ohio river. Between the eastbound yard and the car repair facilities described previously, are several other necessary facilities, the most important of these including a new track scale and new icing facilities.

The track scale, which is designed for motion weighing, has a 72-ft. effective weighing rail and a capacity of 300 tons. This scale is used principally for weighing eastbound loads and empty cars after they have been repaired.

The new facilities for re-icing perishable freight are located toward the west end of the eastbound yard and consist essentially of a 400-ft. double-deck creosoted frame icing platform and a crusher and machinery house.

Extensive Engine Terminal Improvements

The engine terminal is located in a large area east of the car repair facilities and between the westbound and eastbound yards. Here the improvements made are comparable with the large yard changes, new facilities being added and existing facilities being altered and enlarged. Some of the more important work in the engine terminal included the provision of four inbound enginehouse leads equipped with inspection pits, an engine-washing platform, ash hoists and a 2,000-ton reinforced concrete coaling station; four outbound engine-

house leads equipped with repair pits, ash hoists and coaling facilities; a 21-stall enginehouse, the extension of 15 stalls of the existing 40-stall enginehouse, a two-story concrete and brick storehouse, a four-story motive power department office building, an enginehouse machine shop and a 200-ft. extension to the main machine shop, a 100-ft. extension to the blacksmith shop, the rebuilding of the walls of the erecting shop to provide larger window area and to strengthen crane runways, an enginehouse foreman's office, an enginemen's report building, an increase in the power plant capacity by the installation of two 400-hp. stoker-fired boilers and complete coal-handling facilities, an electrical repair shop, the enlargement of the water supply facilities, new scrap handling facilities, new toilet, wash and locker buildings, and a complete layout of concrete driveways, 16 ft. wide, extending throughout practically the entire shop area. This extensive work, most of which has been done during the past three years, involved many interesting features of design and construction, and entailed most careful planning and execution in order to prevent interference with the orderly functioning of the terminal while construction was under way.

In the operation of the engine terminal, incoming engines, which number about 125 a day, approach the enginehouses from the west over one of four lead tracks, adequate engine-running tracks having been provided to afford ready access to these leads from all of the yards. An unusual feature in this regard is the arrangement provided for the movement of inbound engines in the westbound receiving yard to the enginehouses. This involves a new single-track concrete-box underpass beneath the westbound hump, which forms a direct route for inbound engines to the enginehouse leads without sending them over the hump or requiring them to make long runs to get around the hump. This underpass movement, which is controlled by interlocking signals, also gives switch engines a direct route between the westbound receiving and classification yards without the necessity of going over the hump where they would interfere with the weighing and classifying of cars.

Enginehouse Leads Are Fully Equipped

In passing to the enginehouse over any of the four lead tracks, engines first take water from one of three 12-in. Poage standpipes and then pass to the new inspection pits, where the road crews turn the engines over to inspectors. The inspection pits, of which there



Looking East Over the Car Repair Yard Showing the Overhead Cranes

are four, one under each track, are of reinforced concrete, 100 ft. long, and are joined by a lateral underground passage provided with inter-track exits to the yard level and also with a connection at the south end with the basement of the enginemen's report building.

This building, which is used principally by the engine crews and engine inspectors, is a two-story brick and concrete structure, about 35 ft. square. The first floor is used principally as a report and call office, while the second floor is completely equipped with showers, wash fountains, toilets and lockers for the convenience of engine crews.

In order to make possible the quick dispatch of the enginemen's and inspectors' engine reports to the enginehouses, the enginemen's report building is linked to the enginehouse foreman's office between the two enginehouses by a pneumatic tube system, approximately 2,000 ft. in length. Through this arrangement, both of the engine reports are in the enginehouse foreman's office sufficiently in advance of the arrival of engines to make it possible to have all work reports prepared and in the hands of the enginehouse forces by the time the engines reach either of the houses.

From the inspection pits, incoming engines move eastward about 250 ft. to the new engine washing platform where they are cleaned. This platform, which is constructed of reinforced concrete and suitably drained, is 180 ft. long and serves all four lead tracks. The platform is equipped with both hot and cold water washing facilities, hot water being furnished at a temperature of about 180 deg. and under a pressure of 175 to 200 lb.

When cleaned, engines move to the new 2,000-ton coaling station, about 175 ft. to the east, where they take on coal before entering the houses. The coaling station, which also provides for the storage, drying and delivery of sand, is of the cylindrical, reinforced concrete type, constructed by the Roberts and Schaefer Co., Chicago. The station spans four tracks, serving the four inbound engine tracks, and two outbound leads for westbound engines, which lie immediately north of the inbound leads. Operation of the station, except for the drawing of coal and sand, is entirely automatic, the hoisting equipment consisting of two automatic, electrically-operated skip hoists, each with a hoisting capacity of 75 tons of coal per hour. A complete de-

scription of this station was given in the March 26, 1927, issue of the *Railway Age*.

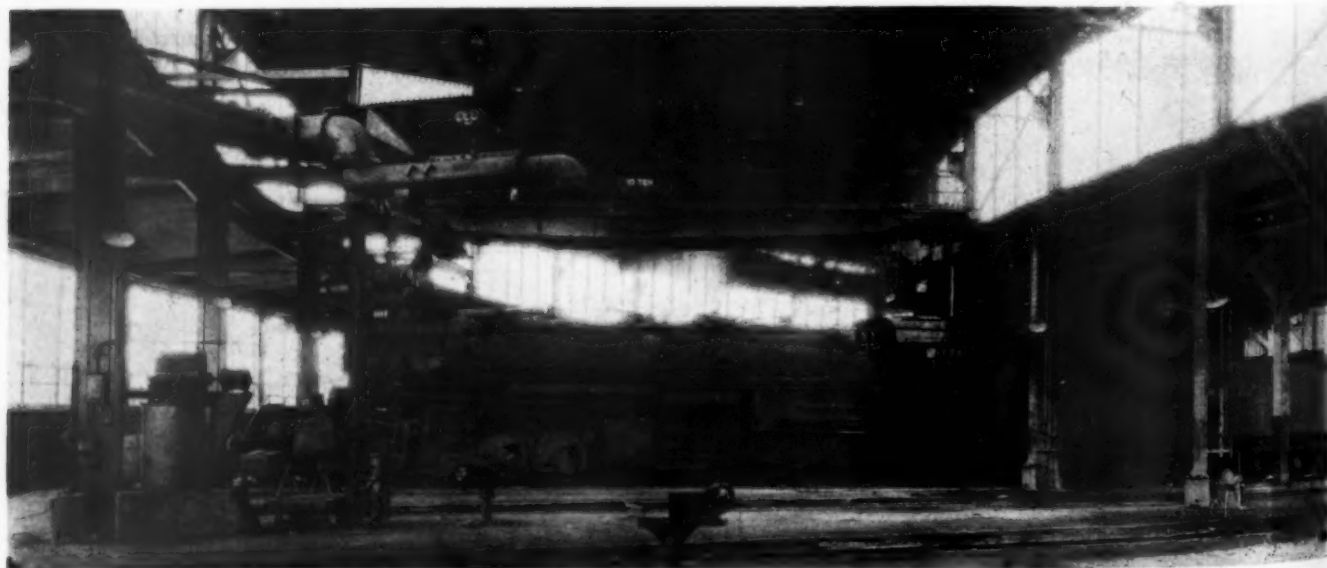
Immediately west of the coaling station the four inbound enginehouse leads converge into two main leads over which all engines pass in going to either of the two enginehouses. These leads are served by four ash hoists of the N. & W. type, which are so spaced that the fires of four engines can be cleaned at one time. A single cinder car track between the two leads serves all four ash hoists.

The enginehouses lie one behind the other in about a direct line with the inbound leads, the more easterly of these houses being the new 21-stall structure. The old house is served by both main leads, which converge into one lead track just ahead of its 115-ft. turntable, while the new house is served by an extension of this lead through the old house, and by an additional lead which swings around the south side of the old house.

There are four outbound leads from the enginehouses, two to the west for westbound power and two to the east for eastbound power. Each of these leads is equipped with an N. & W. type ash hoist, and an inspection pit for making a final inspection of engines before sending them out on the road. In addition, each of the two eastbound leads is equipped with a coal hoist. Through this latter equipment, the coal supply of outgoing eastbound power can be replenished without the necessity of making a backward movement to the main coaling station. As both of the outbound leads to the west are served by the main coaling plant, no auxiliary coaling equipment is necessary on these leads.

New 21-Stall Enginehouse

One of the most important of the new units at the terminal is the 130-ft., 21-stall enginehouse. This house, which is served by a 115-ft. disc-center, balanced type turntable, is a steel frame structure of the monitor type, with brick exterior walls, fixed and ventilating steel sash, a chat floor and a timber roof covered with Barrett built-up roofing. The doors of the house are of the single-hinged type, opening outward against stops between the enginehouse tracks. All of these doors are of steel with an upper panel of sectional steel sash to increase the daylighting within the house when the doors are closed. All of the steel-work within the



Interior of the New Enginehouse, Showing the Special Smoke Exhaust System

house, including the doors, structural framework, sash, etc., is protected from smoke and gases by a corrosion-resisting paint.

The enginehouse has an approach lean-to section, 44½ ft. deep, a main central bay free from columns, 67 ft. wide, and a head bay 18½ ft. deep. All of the house tracks, with the exception of one used as an outbound lead for westbound engines, are equipped with concrete inspection pits, 105 ft. long; in addition, six of the tracks are equipped with engine truck, driver and tender truck drop pits. Two other tracks are equipped with engine truck and forward driver drop pits, and an additional track is equipped with an engine truck drop pit only. All of the driver drop pits are equipped with Whiting drop tables. Another important unit of hoisting equipment at the house includes a 10-ton electric traveling crane which spans the central bay and travels throughout the length of the house.

Special Smoke Exhaust System is Provided

One of the important special features in connection with the new enginehouse is the special smoke exhaust system provided. This consists of a special arrangement of overhead piping for each group of four house tracks, linking four telescoping receiving nozzles or ducts with an overhead exhaust fan which forces locomotive smoke and gases up through a stack. These receiving ducts are so designed that a 15-ft. movement of an engine is possible without disturbing the stack connection. This exhaust system is used not only to carry off the smoke and gases of idle engines, but is also effective for forced drafting and for cooling off the fire boxes of hot engines for inspection purposes. Supplementing this direct exhaust system, ventilators are provided in the sides of the roof monitor, center-hung ventilating sash in the outer circle wall, and hooded longitudinal openings in the roof of the approach lean-to section of the house, directly over the center of each track, to permit the escape of gases while engines are entering or leaving.

Heating of the new enginehouse is by the unit system, wherein steam is distributed to ten unit heaters throughout the outer end of the house, from which blowers force the heated air through underground ducts to the engine pits. In the special adaptation of this system at the enginehouse, each heater serves two pits, the heated air being conveyed through an arrangement of

terra cotta piping which affords four outlets in each pit.

Old Enginehouse Enlarged

The old 40-stall enginehouse is a brick wall structure with timber interior framing, a timber roof covered with asbestos felt roofing, steel sash, concrete inspection and drop pits, and a cinder floor. About 1919, the increase in the size of power handled made it necessary to lengthen the north end of this house, and for the same reason, 15 stalls at the south end of the house were lengthened 25 ft. during 1926 and 1927. Accompanying this latter work, a 100-ft. through plate girder balanced turntable was replaced with a 115-ft. Bethlehem twin-span table.

One of the most important new auxiliaries to the enginehouses is a machine shop which was constructed directly between the two houses. This shop, which is about 110-ft. long by 115-ft. deep, is a brick structure, with a creosoted wood block floor on a concrete sub-base, and with a roof structure of saw-tooth construction. Within this shop, all machine work for the enginehouses is done, this arrangement precluding interference with the work of the machine shop serving the erecting shop. Other new units located between the enginehouses include a roundhouse foreman's office and an arch brick storage house.

New Storehouse Provided

The main locomotive repair shops at the terminal are grouped together in an area west of the enginehouses and immediately south of the four inbound enginehouse leads. Here the principal units include an erecting and boiler shop, a machine shop, and a smith shop. These three shop buildings are laid out parallel with one another, in an easterly-westerly direction, and are connected by a 10-ton cross crane which extends through each building. Between the erecting shop and the machine shop, the cross crane is intersected by another new overhead crane of 10 tons capacity, which extends about 600 ft. to the east and serves the new storehouse. Thus all of the major shop units at the terminal are in direct crane connection with the storehouse from which parts are issued.

The new storehouse is a two-story steel and concrete structure, 50 ft. by 200 ft., with red shale face brick. All four sides of the house are served by wide concrete platforms, that at the east end being 65 ft. wide and



A Portion of the Interior of the Enlarged Machine Shop

100 ft. long, and covered by a clear-span truss roof with a timber top and Barrett built-up roofing.

Both floors of the house are used for the storage of materials, with the exception of a section on the west end of the second floor which is divided into stores department office space. An elevator is provided for handling materials from floor to floor. All of the racks, shelving and bins throughout the house are of steel, and are well lighted through the large areas of sectional steel sash in the side and end walls of the building. Artificial lighting is provided through ceiling lights, and also through drop lights arranged along the tops of the shelves and racks. To increase the intensity and uniformity of the lighting, the interior of the storehouse is painted white.

New Office Building is Provided

The major shop improvements consisted of lengthening the machine shop by the construction of a unit 74 ft. wide by 200 ft. long, equipped with a traveling crane and modern machine tools; the lengthening of the blacksmith shop by 100 ft., making its total length 250 ft.; and the reconstruction and strengthening of the walls and crane runways, and enlarging of the windows of the erecting and boiler shops. Other improvements in shop facilities include a new pipe and tin shop, 50 ft. by 120 ft., and the rebuilding and enlarging of the power house to provide for additional boilers, stokers, and complete new mechanical coal and ash handling equipment.

The new motive power department office building, which lies between the locomotive shop facilities and the inbound enginehouse leads, is a four-story steel and concrete structure, 43 ft. wide by 103 ft. long, with a concrete foundation, brick exterior walls, steel sash, concrete floors, and a frame roof covered with Barrett built-up roofing. The first two floors of the building are used almost entirely for offices, the various office facilities being separated by metal and wood partitions which are provided with glazed panels to improve lighting. In the main, the first floor houses offices of the motive power department, while the second floor houses offices of the transportation department.

The third floor is given over to a large gymnasium, with a kitchen, pantry and a cloak room at one end so that the large hall can be used for banquets, meetings and other social activities of the employees. The

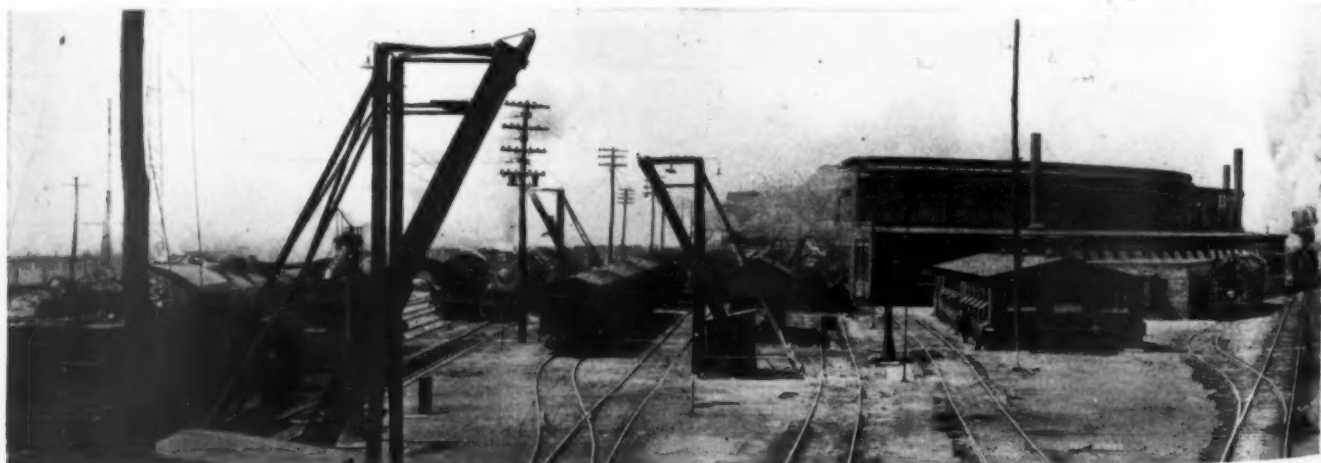
fourth floor, which extends over only the kitchen and cloak room facilities of the third floor, is laid out with a balcony facing the gymnasium, and with locker and toilet facilities for both men and women. Above the fourth floor area is an attic which is fully equipped with metal shelving for the storage of records.

In order to provide for the safety and convenience of the office and shop employees, the office building is joined with the city streets on the opposite side of the terminal yards by a new overhead foot bridge. This bridge, which is about 500 ft. long, is a through truss structure of copper-bearing steel, and rests on concrete piers.

Water Facilities Enlarged

As a part of the extensive improvements already described, the Portsmouth terminal has been equipped with a practically new fire protection system, and with a new water supply system which is designed to feed the various standpipes and to supply the new buildings with both treated and untreated water. Through the new facilities, 400,000 gal. of treated water is stored constantly in two 200,000-gal. steel tanks, 50 ft. high, and 400,000 gal. of untreated water is stored in one large tank, 108 ft. high. Water from either of these supplies is delivered by gravity to both the power house and the fire pumps. The fire pumps, through the provision of check valves and special control, furnish untreated water to all of the terminal hydrants in an arrangement which makes it possible to deliver untreated fire water to the hydrants without interfering with the usual delivery of treated water to locomotives and the shop buildings.

The principal contractors and contracting companies on the extensive work at Portsmouth were W. W. Boxley, Roanoke, Va., who did all of the grading, and J. P. Pettyjohn & Co., Lynchburg, Va., and H. A. Lucas, Roanoke, who handled the major part of the building work. The track work in connection with the improvements was handled entirely by company forces. All of the work at Portsmouth was done under the direction of W. P. Wiltsee, chief engineer of the Norfolk and Western, and F. P. Turner, principal assistant engineer. The field work was in charge of C. E. Armstrong, assistant engineer, and was supervised by H. E. Smith and C. H. Whitt, resident engineers. The new buildings were designed by L. L. Kelly, bridge engineer.



Facilities for Outbound Engines. Engine Supply House, Roundhouse Toilet and New Roundhouse Shown on Right. Ash Hoists and Coal Hoists on Left

The Railroad Outlook for 1929*

Increase in freight traffic and in income and percentage of return considered probable

By Julius H. Parmelee

Director, Bureau of Railway Economics

THE traffic activity of the steam railways is not an economic phenomenon that moves by itself. On the contrary, railway activity grows out of and depends upon the collective activities of agriculture, the mining and manufacturing industry, and the mercantile industry, because railroads distribute the products of the farm, the mine, and the factory, and are actively employed to the extent that the other elements of distribution are active.

Considered from this angle, the railways and the banking industry have much in common. Financial activity is at high level when industrial activity is great, and the reverse is usually true.

In considering the railway outlook for any year, therefore, the principal problem is to go behind the immediate prospects of railway traffic, and to consider what are the possibilities of active production and movement in all the basic industries which distribute their products by rail. To make a complete analytical forecast, it would thus be necessary for me to cross the boundaries between my own subject and those assigned to my colleagues on the present program, and to pass into other fields as well.

Neither time nor opportunity exists for any such extensive consideration of the railroad outlook for 1929, and I will, therefore, devote myself principally to a statistical and graphic analysis of what has been happening in the railway field during recent years, and what may conceivably happen this year in the light of recent experience.

I will devote myself principally to the freight traffic in 1929. This I do for two reasons: first, four-fifths of the revenue flowing into railway coffers comes from the freight business, and second, the trend of passenger traffic has been steadily downward, and there appears no reason to believe that the trend has been checked.

Decline in Passenger Traffic

Let us consider first the passenger situation, then pass on to a more extensive consideration of the freight situation. Up to 1920, the trend of passenger traffic on the railways was generally upward. In that year the number of passenger-miles handled by the railways was the greatest on record. Since 1920, principally because of automotive competition of various types, the trend has been almost as steadily downward. As a result of this virtually unbroken decline, the total number of passenger-miles in 1928 was the smallest reported since 1909, and represented a decline of one-third under the peak of 1920. Every month during 1928 showed a decline under the corresponding month of the preceding year, the reduction for the year being more than six per cent, and the same trend seems to be under way in 1929. The returns for January this year indicate a reduction in passenger traffic and revenue under the corresponding month of 1928 of nearly five per cent.

The effect on passenger revenue may well be imagined. In 1920, total rail revenue from the transportation of passengers was close to 13 hundred millions of dol-

lars, the largest amount ever received for passenger business in a single year. The continuing decline since that year brought it below a billion dollars in 1927, while in 1928 it fell to 900 millions.

Freight Situation More Hopeful

Turning to the freight traffic, the situation is more hopeful. Much attention has recently been directed to the fact that the railways are meeting severe competition from other agencies of freight traffic, particularly the truck on the highway and the boat or barge on the inland waterway. That this competition exists, there is no question. But we generally overlook the fact that it has not yet made great inroads into rail freight movement. I use the word "great" in a relative sense, of course. Careful estimates seem to indicate that the number of ton-miles handled by trucks on our highways each year, so far as they are competitive with railway traffic, plus the total ton-miles by inland waterways, exclusive of the Great Lakes and the Panama Canal, do not represent more than six per cent of the total ton-miles by rail. Including the Panama Canal, the ratio would of course be greater.

Despite active competition from the highway and the waterway, and to a lesser degree from the air, the railways in 1926, 1927, and 1928 handled the largest traffic of any three years in their history. The total freight traffic for 1926 was the greatest for any one year on record; the freight traffic for 1928 was the second greatest; while the freight traffic for 1927 was the third greatest.

Such a statement does not tell the whole story. The question does not go so much to the actual amount of traffic handled by rail, as to its recent trend. Consideration of that phase of the question also offers some elements of encouragement.

When the Interstate Commerce Commission was considering a general reduction in the freight rates in 1922, the statistician of the commission prepared a chart, showing the trend of freight and passenger traffic from 1890 to 1921. The trend for the pre-war years from 1890 to 1915 was projected to the year 1930.

This chart was reproduced by the commission in its decision in the so-called Reduced Rates Case of 1922. It is so interesting in its implications that I have reproduced it, in the form of two charts, one of which deals with the passenger trend in terms of revenue passenger-miles, while the other deals with the freight trend in terms of revenue ton-miles. I have superimposed on the chart, for the years 1922 to 1928, inclusive, a curve showing the actual results, as compared with the projected trend.

Traffic Trends

The passenger chart emphasizes what has already been said with respect to the decline in passenger traffic since 1920. The projected trend line and the actual line have followed different directions since 1922, and show steadily widening spreads as the years go on.

The freight chart tells a different tale. While the actual traffic remained below the projected trend line in

*From an address before the American Statistical Association in New York, March 14, 1929.

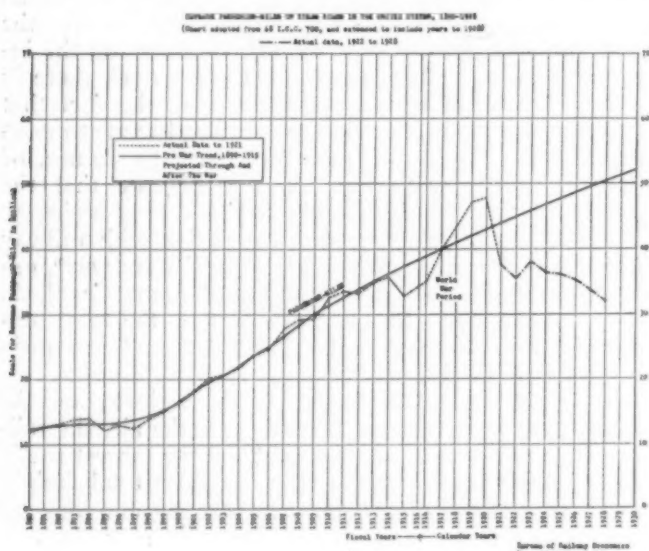
1921 and 1922, every year from 1923 to 1928 has run above that trend. This was especially true in 1926, 1927, and 1928, the average result for those three years being above the trend line by nearly ten per cent.

Summarizing, not only has the freight traffic of the past three years been the greatest in railway history, but it has also run above the level of a trend line based on pre-war normal growth.

Recent Financial Results

Turning for a moment to recent financial results, the net operating income earned by the railways in 1926 was the greatest in history, while that earned in 1928 was the second greatest. Although the totals represented by the net operating income in these two years were large, they did not represent a high rate of return on railway investment, that rate being below five per cent in both of the years.

What now are the prospects for 1929? We have two



The Trend of Passenger Traffic

guides, one being the trend of recent years, the other the first few weeks of the present year. As we stand now at the middle of March, the performance thus far in 1929 will supply a corrective factor to any more general estimate.

Prospects for 1929

The general trend of freight traffic being upward, it would be logical to expect some increase in 1929 over 1928 and 1927, although traffic must increase about three per cent over 1928 merely to get back to the peak of 1926, from which the past two years have receded. To place 1929 in the same relative position as 1926 with respect to the trend line, the increase of 1929 over 1928 must be seven per cent. That is, such an increase would place the 1929 traffic as much above the trend line as was the traffic of 1926. On the other hand, the traffic this year could drop five per cent under 1928, and still be above the trend line for 1929.

Trying another method of approach, the normal annual growth of railway ton-miles has recently been computed at $3\frac{1}{2}$ per cent. My own analysis of varying periods of growth since 1890 shows increases ranging between a minimum of $2\frac{1}{2}$ and a maximum of 5 per cent per year. Utilizing the minimum of $2\frac{1}{2}$ per cent, and applying it to the last four years, the aggregate for 1929 would be about six per cent above 1928, and about three per cent above the record traffic of 1926.

Let us take the extremes of these various methods

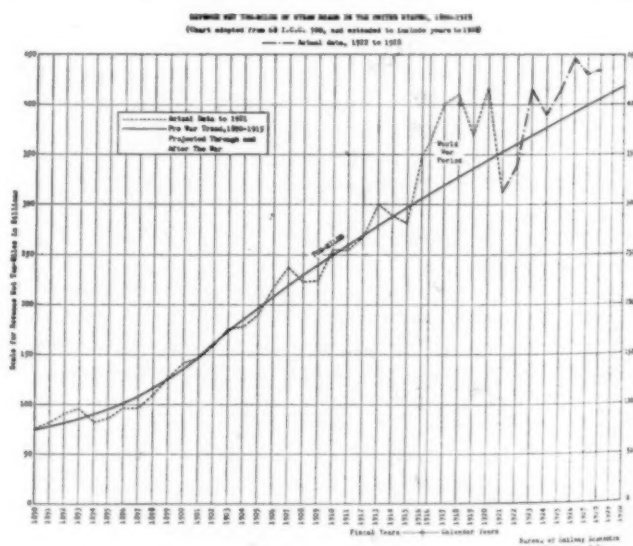
as the possible maximum and minimum for 1929, namely, an increase of 7 per cent over 1928 and a decrease of 5 per cent. This supplies a range of 12 percentage points for purposes of conjecture.

We may now narrow this range of 12 per cent by gradual steps. Basing a computation of possible traffic in 1929 on the more recent trends since 1927, the increase in 1929 would be about one per cent over 1928, and slightly below 1926.

As the current economic factors in other lines of industry seem to point to an increased volume of trade for 1929, and as railway traffic (using the "composite" idea set out in the first paragraph of this presentation) parallels the volume of trade, I think we may safely limit the wider range of 12 per cent to a narrower range, by assuming that the probabilities favor some traffic increase this year. We may further assume that a 7 per cent increase would also be outside the probabilities. On the whole, I incline to a range of 4 points, or from 1 per cent above 1928 to 5 per cent above 1928. Where within this narrower range is the final freight traffic of 1929 likely to strike?

To secure light on this question, we can turn to the results already in hand for 1929.

The net ton-miles of freight traffic for the month of January this year were approximately seven per cent greater than in January last year. Revenue carloading figures, which are available to a later date, show for the first nine weeks of the year, or to March second, an aggregate four per cent greater than in 1928. Were this last percentage of increase to continue through the balance of the year, the total traffic for the year 1929



The Trend of Freight Traffic

would be four per cent above 1928, about two per cent in excess of 1926, and would create a new record in railway freight movement.

However, there is reason to believe that the percentage increases now being experienced will not continue to the close of the year. It happens that the traffic for the first half of 1928 was below normal, while that of the second half was above normal. The performance for the first few months of 1929 is being compared against the relatively depressed months of 1928, and at the same time present results are slightly below the corresponding period of 1926.

The third chart attached to this manuscript gives a picture of moving averages of carloadings by three-month periods. Wherever the curve crosses a vertical line, the point of intersection represents the percentage

by which the carloadings of the three months ending with that month were greater or less than the corresponding three months of the next preceding year.

This curve ran steadily downward in 1927, and struck its lowest point in January, 1928, when it turned as steadily upward to December, 1928. It has now turned down again. If the present rate of decline continues, it will drop below zero—that is, parity with 1928—in June or July and will continue below to the end of the year.

It seems doubtful whether the line will continue to descend at anything like its present rate of decline. Even so, the chart does support the conclusion that the present rate of increase over 1928 will not continue, but will be somewhat reduced for the year as a whole.

Perhaps the best line on the possible traffic results of 1929 may be gained by combining the traffic results of the first nine weeks of the past three years, 1926, 1927, and 1928, and projecting a line from that base. During the first nine weeks of the three years in question, carloadings averaged 8,292,000 cars. The corresponding

of 32 million dollars. Yet the greater efficiency and economy with which the railways operated in 1928 made it possible to reduce total operating expenses by 143 million dollars. After paying somewhat higher taxes and meeting other similar charges, the net operating income showed an increase of 108 million dollars over 1927.

Clearly, economies in cost of operation cannot continue indefinitely. Taxes will almost certainly be greater in 1929 than in 1928, and in 1928 they absorbed the greatest proportion of rail revenue ever experienced. But an increase of, say 75 millions in total revenue should mean an increase of more than half that amount, or perhaps 50 millions, in net income. If the increase in revenue should equal or exceed 100 millions, a larger proportion would probably go through to the net income item, which would be increased by from 50 to 75 millions.

Giving consideration to all the "ifs" in the problem, and with due realization of the dangers of prophecy even nine months ahead, the following are my guesses as to the various elements of the railroad outlook for 1929:

1. An increase of from one to two per cent in freight traffic.
2. A decline of five per cent in passenger traffic.
3. An increase of 75 to 100 millions in rail revenues.
4. An increase of 50 to 75 millions in net operating income.
5. A rate of return on investment ranging between 4.8 and 5.0 per cent, compared with 4.71 per cent in 1928.

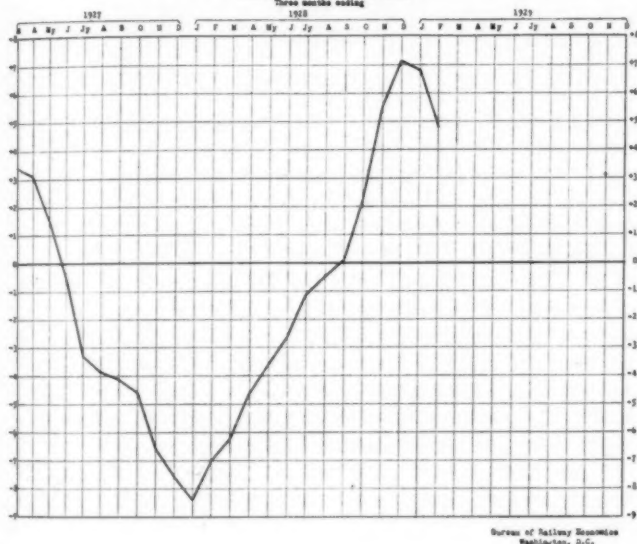
Transportation Aspects of the St. Lawrence Waterway

THE conclusion that the total volume of traffic likely to use the proposed St. Lawrence waterway route if shipping services were provided would not exceed ten or twelve million tons annually, of which grain would make up over 60 per cent, and that the annual charges to be borne by the taxpayers would amount to approximately \$4 a ton on all the traffic carried, was expressed by Dr. Harold G. Moulton, president of the Brookings Institution, of Washington, D. C., in an address before the Traffic Club of Chicago on March 21.

Following a comprehensive study of the waterway project conducted by the Institute of Economics of the Brookings Institution, Dr. Moulton asserted that the cost would greatly exceed the estimates which have heretofore been made that the annual overhead charges on the navigation project would amount to at least \$40,000,000 as the annual contribution of the taxpayers, that a 27-foot channel would not accommodate typical ocean cargo liners now being constructed, and that, even if an adequate depth of channel were provided, ocean vessels generally would not be attracted into the Great Lakes. A synopsis of the address follows:

The construction of the St. Lawrence waterway has been urged upon three principal grounds. First, it is contended that it will greatly reduce transportation costs, thereby giving much needed relief to the interior of the country; second, that it is necessary for the purpose of relieving railway traffic congestion; and, third, that it will lead to the development of vast waterpower resources. Since the St. Lawrence river flows for a part

MOVING AVERAGES OF CARLOADINGS - 1927, 1928 AND 1929
Per Cent of Increase or Decrease Over Corresponding Period of Preceding Year
(Challenge of Class I - United States)
Three months ending



Moving Averages of Carloadings

total for 1929 has been 8,315,000 cars, an increase of three-tenths of one per cent. If this increase is continued to the end of the year, total traffic for 1929 will increase more than one per cent above 1928 and 1927, but will be nearly two per cent below 1926. The year 1929 would then not break the record, but would stand as the second best year in history.

Increase in Operating Revenues Likely

To bring these predictions to a definite statement in terms of money, rail operating revenues for 1929 will apparently experience an increase of from one to two per cent in freight revenue, and a decline of five per cent in passenger revenue. Revenues from mail, express, and other sources are likely to exceed those for 1928. On the whole, I look for an increase in total operating revenues of from seventy-five million dollars to a hundred million, compared with 1928.

What will this mean in net operating income, after expenses and taxes have been met? The answer to this question may be gleaned in part from the experience of 1928. In that year, freight revenue showed an increase of 39 million dollars, passenger revenue a decrease of 76 million dollars, and other revenues an increase of five millions. The net result of these various increases and decreases was a total decline in operating revenues

of its course between the United States and Canada, the co-operation of the two governments is required if the project is to be carried to completion.

For several years the Institute of Economics of the Brookings Institution has been studying the economic aspects of the St. Lawrence waterway in its relationship to the general transportation and power problems with which both Canada and the United States are concerned. I am here concerned with discussing only the transportation phase of the problem.

Probable Cost

It has been estimated by the Joint Board of Engineers that a 27-foot waterway could be constructed at a cost of \$249,759,000. This figure does not include the costs that are assignable to the power development, amounting to approximately \$213,000,000 more.

These estimates of the engineering board do not, however, by any means measure the total costs that would have to be incurred by the people of the United States and Canada in constructing the waterway and making it available for ocean shipping purposes. In the first place, interest on the capital invested during the years of its construction is admittedly not included; second, the cost of harbor improvements and port developments is not in the picture; and, third, the cost of the Welland canal which the Canadian government already has under construction at an estimated cost of \$115,000,000 has not been included. On the basis of the known costs of similar waterway developments, we have concluded that the total cost of constructing a 27-foot channel and providing that depth in interconnecting channels and lake harbors would amount to more than \$700,000,000. The additional costs assigned to power would bring the grand total to more than \$900,000,000.

The annual overhead expenses on the navigation project, including maintenance and up-keep, would amount to at least \$40,000,000. This sum would represent the annual contribution of the taxpayers of the country for the support of this enterprise. It would be a direct subsidy intended to reduce the transportation rate that shippers would otherwise have to pay. In considering the total national cost of transportation, these overhead charges cannot of course be ignored.

It has been assumed that a channel depth of 27 feet would accommodate, if not great passenger liners, at least the bulk of ocean shipping. We have made an investigation of the depth of channel that would be required if the more efficient ocean cargo liners of the type that is now typically being constructed in world shipyards were to be able to enter the Lakes. We find that a 27-foot channel would accommodate practically none of the combination passenger and cargo vessels now engaged in the overseas trade of the United States; that it would accommodate only about 13 per cent of the tonnage now operating on regular schedules out of Montreal, and only about 40 per cent of the tonnage of grain tramps out of Montreal. It would, moreover, accommodate only about 38 per cent of the tonnage of all cargo boats, including tramps, at present engaged in the overseas trade in the United States, and including only 15 per cent of the vessels having a speed as great as 12 knots per hour.

In brief, a 27-foot channel limited to vessels drawing 24 ft. 6 in. would accommodate only boats of the type now engaged in the coastwise trade and the smaller steamers, mainly the war-built United States Shipping Board boats and trampers. In view of the depth now required for the more efficient type of ocean cargo liners, and in view of the fact that the trend in ocean shipping is steadily toward larger and deeper draft vessels, it is our conclusion that a channel depth of 33 feet would be

required if the St. Lawrence waterway were to open the Great Lakes to ocean shipping generally and enable Lake cities to rival Atlantic Coast ports as entrepôts of commerce.

Who Will Use the Waterway?

In the course of our investigation the question was raised whether, even if an adequate depth of channel were provided, ocean boats would establish regular shipping lines into the Lakes. Since the route would be open to navigation for only a little over half of each year, the question of prime significance was whether it would be practicable to operate regular liners in and out of the Lakes during the summer months, and then shift the vessels so employed to other trade routes during the winter months.

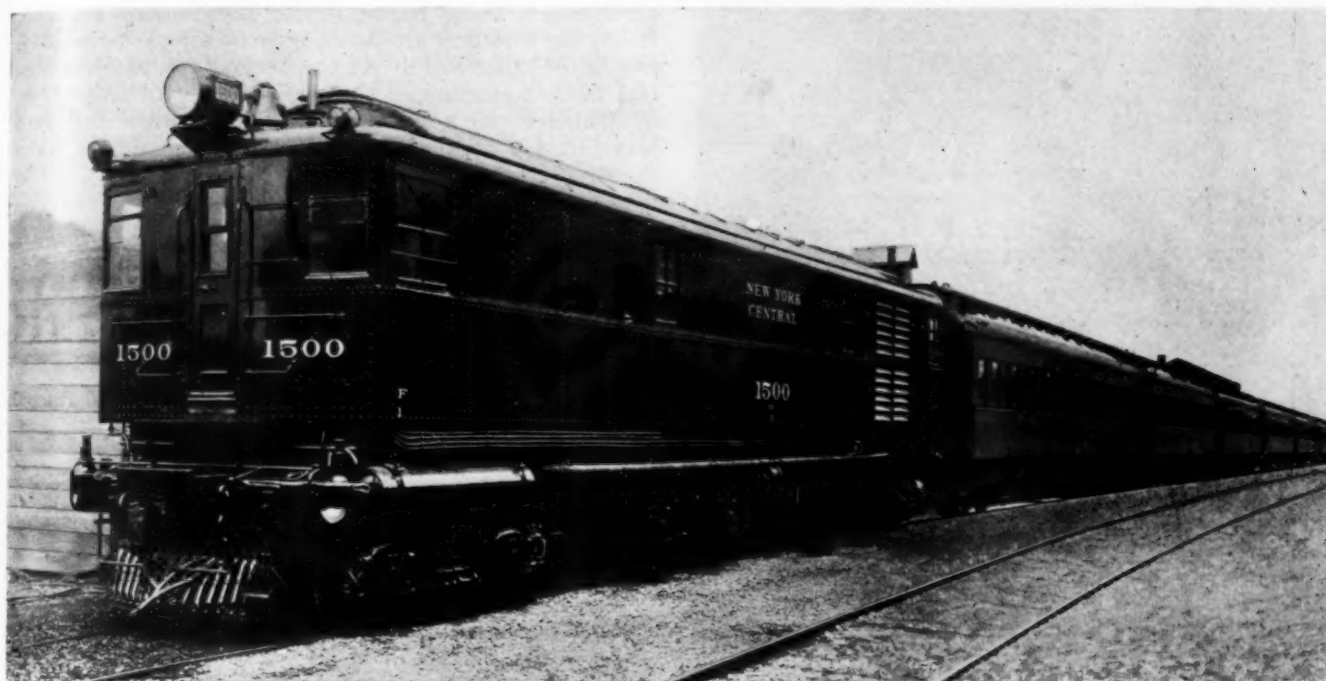
We have taken the matter up with the leading shipping companies of the world and the opinion appears to be practically unanimous that cargo liners would find it impossible to shift during the winter months to other routes and find remunerative employment; and that it would be impossible to earn enough during the season of open navigation to permit the ships to lie idle during the off season. The case does not appear to be so conclusive with tramp vessels, though even here great difficulties are foreseen in finding remunerative employment in the winter months for tramps engaged in the Great Lakes trade in summer. As one ship operator puts it: "I can speak from personal experience, as we have had tramp vessels bound by contract to several summer seasons of St. Lawrence trade, and have found it difficult to get freights for the winter months to give even a most modest remuneration."

The most that could possibly be expected is that the St. Lawrence waterway would be navigated by a limited number of second-class cargo liners, by smaller coastwise vessels, and by tramp steamers. Those who have assumed that ocean vessels generally would be attracted into the Lakes have obviously given no consideration to the problem as it presents itself to the ship owner.

In estimating the amount of traffic available for movement over the St. Lawrence waterway, we have made a special investigation of every important class of traffic that might conceivably make use of the waterway. That is to say, instead of assuming, as has been commonly done, that practically all the traffic in a Great Lakes zone extending as far west as the Rocky mountains would be "available" for the St. Lawrence waterway, we have considered each separate commodity in relation to the waterway,—studying its place of origin, its character, its shipping requirements, and the various commercial considerations which traffic men must consider. We conclude from these analyses that the total volume of traffic likely to use the route if shipping services were provided would not exceed ten or twelve million tons annually, divided roughly equally between the United States and Canada. Of this total, grain would make up over 60 per cent and the bulk of the remainder would consist of commodities of relatively low value.

The annual charges for interest, maintenance, and up-keep on the waterway which are to be borne by the taxpayers generally would thus amount to approximately \$4.00 a ton on all the traffic carried.

FROM COQUITLAM, B. C., near Vancouver, comes the news that 30,000 tons of railroad material—meaning trucks and steel framing for freight cars—will soon be shipped from that point across the Pacific for the Trans-Siberian Railway. This material, it is said, was ordered 13 years ago but, delivery having been prevented by the outbreak of the revolution in Russia, it has been lying in the yard of the Canadian Pacific at Coquitlam all this time.



Locomotive and Train on the Putnam Division of the New York Central

Diesel-Electric Passenger Locomotive for New York Central

Twelve-cylinder, air-injection engine developing 900 horsepower has governed-torque, multiple-unit control

By S. T. Dodd

Railway Engineering Department, General Electric Company

THE New York Central has recently had delivered to it a Diesel-electric locomotive for passenger service on the Putnam division. It is intended to handle the regular through passenger trains with the same running time as is now made by steam locomotives. The American Locomotive Company designed and built the mechanical equipment, including cab and running gear; the General Electric Company furnished the electrical equipment; and the McIntosh & Seymour Corporation supplied the oil engine and completed the installation of the equipment.

Cab and Running Gear

The running gear of the locomotive is of the 2-D-2 type, having eight driving wheels in the main frame and two two-axle trucks for guiding purposes. The rigid wheelbase of the main frame is 18 ft., 6 in. with 44-in. driving wheels. The wheelbase of each guiding truck is 6 ft., 2 in., with 30-in. wheels. The main frame is formed of cast steel side frames and cross ties supported on a system of equalizers and semi-elliptic springs resting on the journal boxes. Couplers are ARA type D, with friction draft gear, mounted on the end frames.

The locomotive is furnished with air reservoirs of

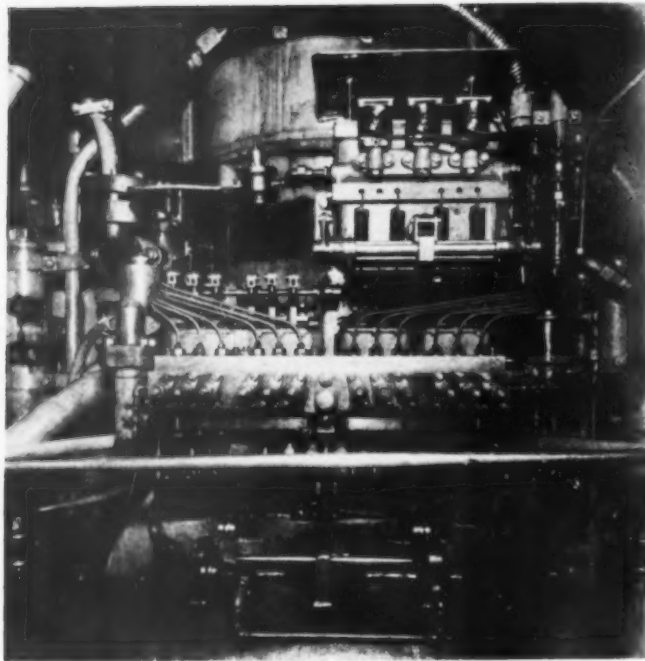
43,638 cu. in. capacity. Brakes are applied to all wheels and are operated by four, 12 in. by 8-in. brake cylinders on the driving wheels and two 6 in. by 8-in. cylinders mounted on each of the guiding trucks.

Four Compartments in Cab

The cab has four compartments: A central compartment for the main power apparatus; operating compartments at either end of the locomotive; and, connecting with one of the operating compartments, a smaller compartment for the traction motor fans and the motor-generator set for charging the 32-volt battery from the 250-volt auxiliary circuit. On each side of this smaller compartment is a radiator for cooling the circulating water from the engine. In one of the operating compartments is located the train heating boiler. A water tank for maintaining water level above the engine cylinder heads is located on one of the interior partitions just below the roof. The main fuel oil tanks of a total capacity of 388 gal. are located below the cab floor, two at one end of the locomotive and one at the other.

Each operating compartment is fitted with apparatus as follows:

Starting controller for starting the engine.



Fuel Injection Pumps and Control

Master controller for controlling the engine output, the generator excitation, and the motor combinations.
 Brake valves.
 Ammeter indicating motor current.
 Voltmeter indicating generator voltage.
 Distant reading thermometer indicating temperature of engine cooling water.
 Necessary gage lamps for illumination of instruments.
 Lubricating oil pressure gage.

Oil Engine

The engine which furnishes the power for the locomotive was designed and built by McIntosh & Seymour Corporation of Auburn, N. Y., and is a four-stroke cycle

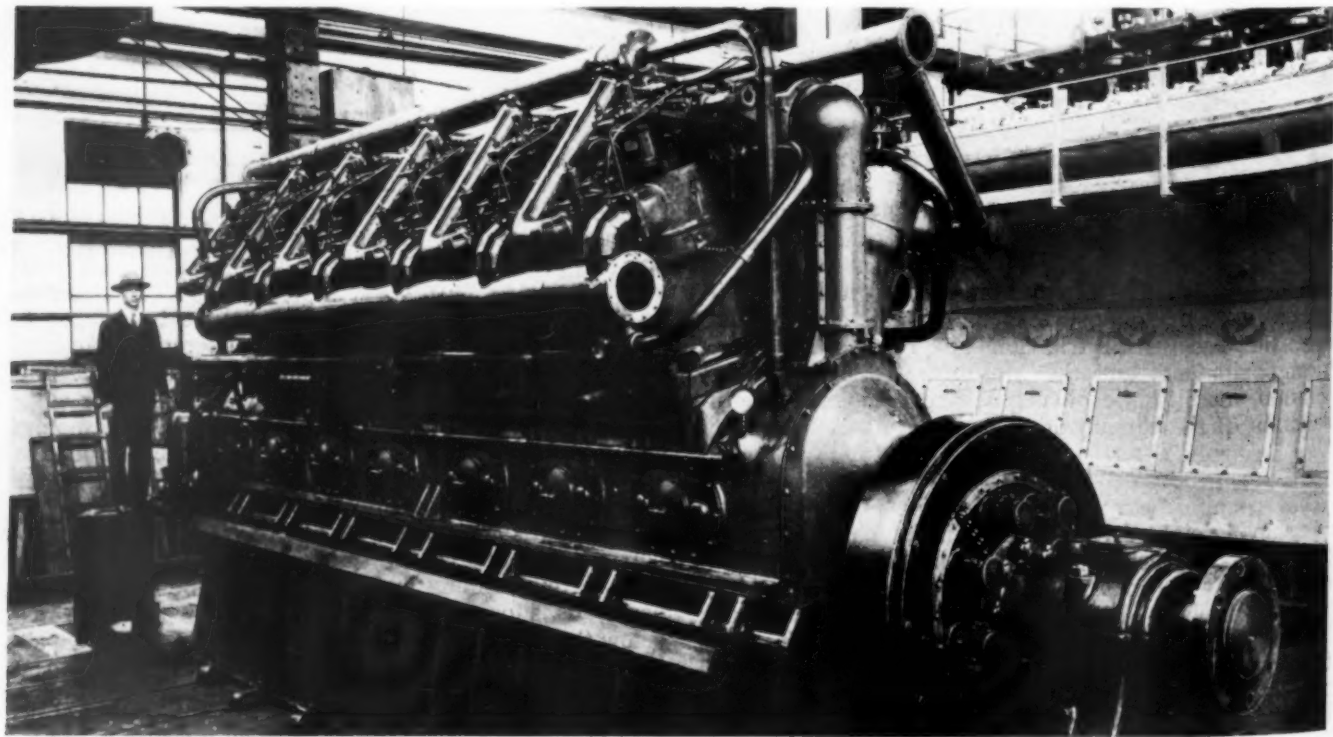
air-injection Diesel engine of the 12-cylinder "V" type. It has the injection air compressor mounted at one end, and at the other end drives the generator through a special flexible coupling. The engine has cylinders 14 in. in diameter and a stroke of 18 in., a normal full load speed of 310 r.p.m., and a full load rating of 900 brake horsepower, with a 10 per cent overload capacity. The idling speed and the speed at intermediate powers is controlled by the operator and is limited by the electrical load and the overspeed control.

The engine, generator and the whole cab structure are carried on a specially designed Commonwealth cast steel underframe. The engine has a semi-steel base with the bottom cast in to hold the lubricating oil. The engine base and the generator are securely bolted to the Commonwealth cab underframe. A box frame of semi-steel is mounted on the base and the engine cylinders are mounted on top of the box frame. The engine cylinders are provided with removable heads, each head containing an exhaust valve, an air intake valve, fuel valve, and indicator connection to which a small safety valve is attached. There are also air starting valves on the heads for six of the cylinders.

The valves are actuated by light cast steel rockers from a cam shaft located between the cylinders, which is driven by spur and bevel gears from the after end of the crank shaft.

At the compressor end of the engine are mounted the fuel pumps, a separate plunger being provided for each cylinder. These fuel pumps are governed by electric regulation which controls the amount of oil supplied to the cylinders and consequently the torque which the engine can develop for any desired control setting. The fuel pumps are also connected to an overspeed control which prevents the speed of the engine from exceeding the proper limit.

At each side of the fuel pumps are mounted the water circulating pumps, which circulate the water from the engine through the radiators. The lubricating pump which takes the oil from the engine base is located in the engine base and pumps the oil through the coolers, and



McIntosh & Seymour 900-Hp. Diesel Engine Assembled On Testing Floor

delivers it to the lubricating oil storage tank; from this tank another pump takes the oil and supplies it to the forced lubrication system. The pumps are all directly driven from the engine.

The exhaust manifolds are at each side of the engine. Both manifolds go into one silencer, and the pipe taking the gas from the silencer goes up through the roof of the locomotive.

If the engine took its air from the engine compartment this amount of cold air coming into the compart-

Principal Dimensions and Performance Data

Length inside of knuckles	59 ft. 4 in.
Height over cab	14 ft. 8½ in.
Width over-all	10 ft. 0 in.
Total wheelbase	49 ft. 4 in.
Rigid wheelbase, driving	18 ft. 6 in.
Rigid wheelbase, truck	6 ft. 2 in.
Diameter driving wheels	44 in.
Weight in running order	361,500 lb.
Weight on drivers	185,000 lb.
Maximum tractive effort at 25 per cent coef.	46,300 lb.
Tractive effort, 1 hr. rating	28,000 lb.
Tractive effort, continuous	16,000 lb.

Equipment List

NAME OF UNIT	NO. OF UNITS	MAKE	POWER OR CAPACITY
MAIN POWER			
Diesel engine	1	McIntosh & Seymour	900 b.hp.
Generator	1	General Electric	DT-751
Exciter	1	General Electric	TE-751
Main traction motors	4	General Electric	GE-286
Traction motor blowers	2	Sturtevant	4400 cu. ft. per min. each
Traction motor blower motors	2	General Electric	1½ hp. each
Control equipment	1	General Electric	Remote control
Silencer	1	Special	35 in. dia. x 52 in. lg.
AUXILIARY POWER AND COOLING EQUIPMENT			
Aux. compressor	1	Rix—1000 lb. air cooled	8 cu. ft.
Aux. compressor engine	1	New-Way—gasoline	5 hp.
Main circulating pumps	2	McIntosh & Seymour—connected to engine	325 g.p.m.
Radiators	2	Modine	
Radiator fans	4	Sturtevant	12,500 cu. ft. per min. each
Radiator fan motors	2	General Electric	10 hp. each
Cooling water thermometers	2	Moto Company	220 deg.
FUEL OIL EQUIPMENT			
Main fuel oil tanks	3	Aluminum Co. of America	388 gal. total
Auxiliary fuel oil tank	1	Aluminum Co. of America	25 gal.
Fuel oil service pump	1	Viking Pump Co.—connected to engine	3 g.p.m.
Fuel oil level gage	1	Rumsey—hand-driven	5 g.p.m.
Fuel oil level gage	1	McIntosh & Seymour	Sounding rod
Fuel oil strainer	1	King-Seeley—located in cab	
Fuel oil strainer	1	Schutte & Koerting	
LUBRICATING EQUIPMENT			
Main lubricating oil tank	1	Aluminum Co. of America	80 gals.
Lubricating oil pump	1	Schutte & Koerting—direct-driven	30 g.p.m.
Lubricating oil pump	1	Schutte & Koerting	30 g.p.m.
Lubricating oil strainer	1	Schutte & Koerting	
Lubricating oil pump	1	Rumsey—hand-driven	5 g.p.m.
AIR AND HEATING EQUIPMENT			
Main compressor	1	McIntosh & Seymour—connected	
Starting air receivers	2	National Tube Co.	7.8 cu. ft. each

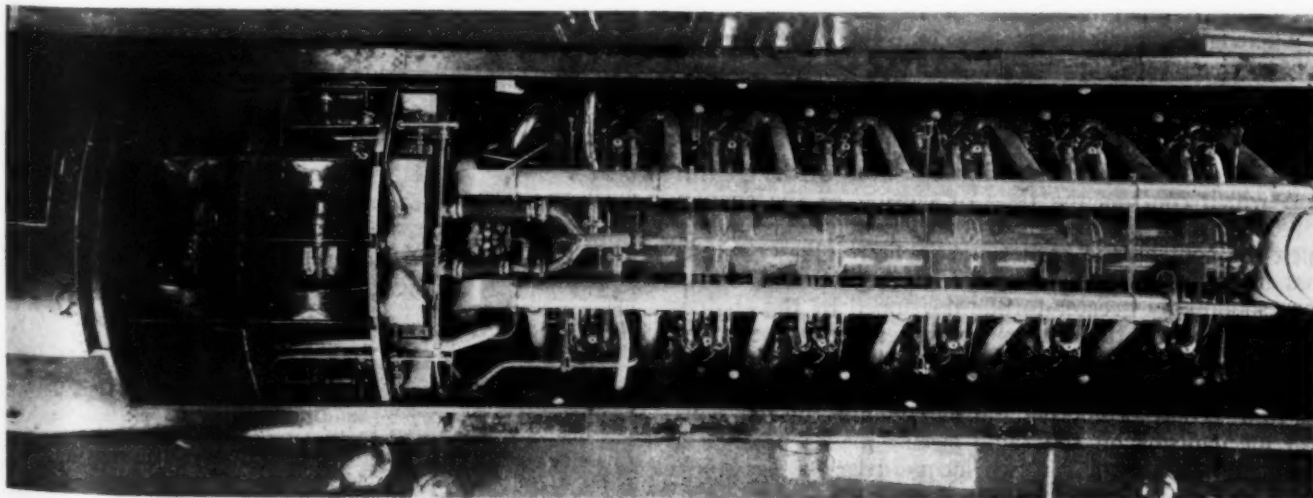
Battery Charging Motor-Generator Set and Control

Injection air receiver	1	National Tube Co.	
Main boiler	1	Otis-Sawyer	2000 lb.
Feed water pump	1	Buffalo Steam Pump	3 x 2 x 3½
Oil burner	1	New York Central—special	
Main air brake compressor ..	1	General Electric	100 cu. ft.
CAB			
Underframe	1	Commonwealth	1-piece
Main frames	2	Cast Steel	
Draft gear	2	Miner friction	
Couplers	2	A.R.A. Std.	
Sanders	8	Graham-White	
Engine trucks	2	Commonwealth	1-piece
Storage battery	1	Exide	150 amp. hours
Battery charging set	1	General Electric	2½ kw.

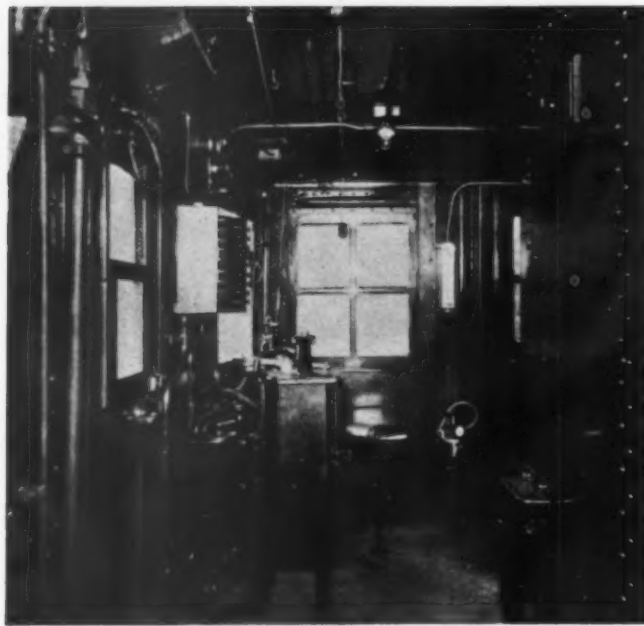
ment from outside in the winter would make the temperature undesirably low. Therefor the engine is supplied with air intake heaters so that the engine takes its air from the compartment occupied by the traction motor blowers which is connected by louvers in the roof with the outside air.

Cooling water for the engine is cooled in Modine type radiators, half the radiating surface being placed in each side of the locomotive. A water tank with ample capacity is located at the top of the radiators so that the cooling system is filled with water at all times. To provide the cooling, four motor-driven Sturtevant fans draw air through the radiators and discharge it through shutters located on the roof.

Connected to the engine is a small rotary fuel pump which takes the oil from the main storage tanks and



Top View of Locomotive From Overhead Crane Showing Location of Engine



Operator's Position in No. 1 End

delivers it to the fuel oil service tank in the roof of the locomotive. Surplus oil from this service tank goes through the overflow back to the main storage tank. Oil from this service tank is supplied by gravity to the fuel pumps on the engine, and also to the burner of the heating boiler.

For heating the train there is an Otis-Sawyer boiler of the same size and type now used on New York Central Type S electric locomotives. Two water tanks are provided for feed water for this boiler and there is a small steam pump in the engine compartment for supplying water to the boiler.

Two air receivers suitable for 1000 lb. pressure are supplied for the storage of the air required for starting. These receivers are charged ordinarily from the main engine compressor while the main engine is running. This air is reduced to 350 lb. pressure at the engine when used for starting.

In the engine compartment is a gasoline engine-driven, two-stage compressor for emergency service which can be used for charging the injection air receiver or the starting air receivers, if the pressure in these receivers has become too low due to leakage or overhauling while the engine is standing.

The engine output is remotely controlled by the master controller already mentioned. This master controller operates an output controlling device mounted on the engine, consisting of a number of pneumatically operated pistons, each controlled by a magnet valve. Each of these pistons establishes a definite position of the control arm which controls the time of closing of the suction valve for each plunger of the fuel pump. The wider open the control, the earlier the suction valves close so that more fuel is pumped to the engine cylinders and a correspondingly greater torque developed by the engine. The position of the master controller thus determines the quantity of fuel supplied at each stroke and the torque of the engine. The same device would be applicable to a second locomotive and by coupling the two control mechanisms on the same circuit makes possible a multiple-unit control for two locomotives.

Electrical Equipment

The electrical equipment includes a main generator and an auxiliary generator direct connected to the engine,

four traction motors, control equipment and electric auxiliaries, lights and instruments.

Main Generator

The main generator is of the multi-polar type carrying 10 main poles and 10 commutating poles. The magnet frame is fabricated from rolled steel with the halves welded together. The generator is of the two-bearing type, the weight of the armature being carried entirely on the armature bearings. The generator shaft is extended at one end to carry the auxiliary generator armature outside of the bearing and at the other end to provide for a flexible coupling connecting it to the engine. There are three distinct field windings on the main poles: 1—A small amount of differential series winding. 2—A self-excited shunt winding. 3—A separately-excited winding.

The self-excited field furnishes the principal excitation for the generator. The separately-excited field receives current from the auxiliary generator. A resistance is provided for use in series with this field, proportioned for each control position so that the characteristics of the generator correspond to the required engine torque at each particular control position. By this means there are obtained, with the same speed, approximately equal increments of tractive effort at the driving wheels for each controller step; or, with the same tractive effort, equal increments of speed. The controller thus establishes a definite engine torque, and simultaneously a setting of the field strength which is most desirable at this output.

The auxiliary generator mounted on an extension of the main generator shaft supplies the separate excitation at 250 volts for the main generator, as well as power for the auxiliaries. This generator is so regulated that it maintains a practically constant voltage throughout the range of engine speeds.

Four GE-286, 600-volt, single-g geared, commutating pole traction motors, one mounted on each driving axle, drive the locomotive through gearing with a reduction of 69/20. These motors and gears are the same as those used on the New York Central Class R electric road freight locomotives.

Three running combinations of the traction motors are used; series-parallel, parallel, and parallel with re-



Operator's Position in No. 2 End Showing the Train Heating Boiler

duced fields. The various motor combinations are obtained through electro-pneumatic contactors and a reverser actuated by the reverse handle on the master controller. The transfer from series-parallel to the parallel position is effected by interlocking between contactors and by cushioning resistors so that the change is made from one connection to the other with full torque on the engine and without reducing the engine speed during transition.

Compressed air for the brakes is supplied by a G.E. motor-driven air compressor having a displacement of 100 cu. ft. per minute. This compressor is located above the main generator in the main cab.

Power for the compressor, blowers and motor-generator set is supplied from the auxiliary generator. The field of this generator is excited at 32 volts and is regulated by a carbon pile regulator to maintain its terminal voltage at 250 volts through a range of engine speeds from the idling speed up to full speed.

Provision is made for operating blowers either in series or parallel connection. These combinations are controlled by master switches in the operating cabs. This feature is especially desirable for the radiator fans because it provides a means of obtaining reduced radiation in the winter months with a consequent saving in power. The starting and stopping of these fans is automatically accomplished by means of a thermostatic control device.

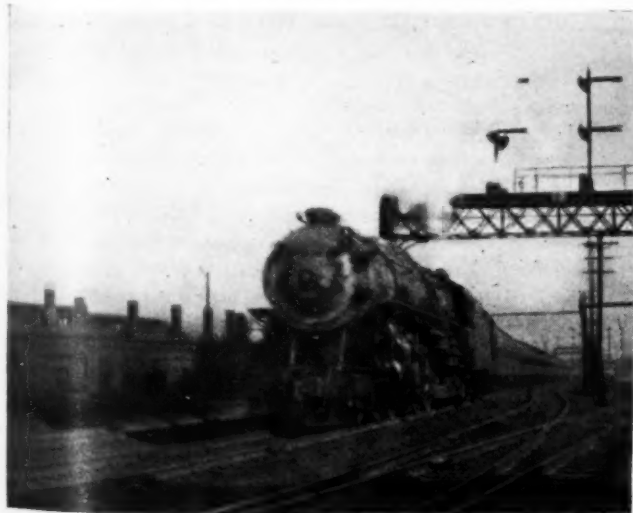
The 32-volt supply for the lighting and control circuits is obtained from a motor generator set driven from the 250-volt auxiliary circuit. A carbon pile regulator in the generator field of this set maintains a constant voltage for the auxiliary circuits, as well as for charging a 32-volt, 150-ampere-hour storage battery. This battery supplies the lighting and control circuits when the engine is not in operation.

Cab lights are located in both the operating and engine compartments. Drop-lights in the engine compartment are provided for inspection while in service. All lights, including the headlights, are supplied from the 32-volt circuit. A dimming resistance is provided for each headlight.

In addition to the meters located at each operating position, there is also an integrating watt hour meter connected to measure the main generator output. An ammeter also indicates the amount of charge or discharge in the storage battery circuit.

Train line couplers at each end of the locomotive permit the operation of two locomotives in multiple unit with the control of both from any operator's position.

* * *



The Lackawanna's "Chicago Limited" Near Hoboken, N. J.

Organization and Manner of Work of the I. C. C.

ADOPTION by Congress of the recommendation made by the Interstate Commerce Commission in its annual report that it be authorized to assign particular matters to individual commissioners or to employees or boards of employees designated by it, for disposition, while the commission would retain control through the process of rehearing, was advocated by Commissioner Clyde B. Aitchison in a lecture, under the Cyrus Fogg Brackett Foundation, before the faculty and students of the School of Engineering, Princeton University, on March 19.

To a great extent the situation confronting the commission, the volume of whose work is more likely to increase than to diminish, "is capable of ready and inexpensive remedy," Commissioner Aitchison said. "The requirements of law as to organization should be revised in this manner, to permit more prompt and efficient dispatch of business. This will enable the commissioners to concentrate upon the greater problems, while they retain responsibility as to the disposition of lesser matters."

Only as they have adequate opportunity to exercise a reasoned discretion upon a full ascertainment of the facts can the body in fact be what it is in theory of law, an expert tribunal. Leadership in this case calls for time for research, for observation, for internal and external consultation, and for proper contemplation. Adoption by Congress of the commission's recommendation will materially aid a difficult situation."

Commissioner Aitchison treated his subject as a study in the organization of a great independent establishment of the government, the oldest of the federal regulatory commissions. After outlining the historical background and the various periods of the commission's history, Mr. Aitchison pointed out that the form of organization and manner of performance is profoundly affected by the imperative requirements of the law calling for the exercise of personal, non-delegable discretion by the commissioners themselves, which has only partly been relieved by the permission given in 1917 to break the body into divisions for the performance of duties.

Analysis of the commission's minutes for a year shows that the votes of the commissioners were required in more than 20,500 distinct matters. Excluding those which could be safely left to subordinates and formal matters, nearly 5,000 matters required the exercise of actual personal discretion by commissioners. The average number of commissioners who acted on each was 6.33 and each commissioner was called upon to exercise his discretion by voting on 2,829 matters in the year. This took no account of the time spent in hearings, argument, preparation, or study. The opinions in cases decided filled 15½ standard law-books and aggregated 11,729 pages.

The assignment of work among the divisions was explained and the bureaus were taken up one by one, and their functions severally explained. The condition of the docket of rate cases, in the Bureau of Formal Cases, causes great concern because of the fact that generally since the war the cases filed have exceeded those disposed of, despite the efforts which have increased the cases disposed of 90 per cent per annum since 1922. This was attributed to the absorbing effect of the nationwide rate structure survey undertaken pursuant to the Hoch-Smith resolution; to the great number of cases

which the shortened procedure has encouraged, personnel changes due to the "graduation" of experienced commissioners and employees into private life, and the unnecessary rigidity of a system which brings a mass of trivial matters to the commissioners for consideration, and reduces the time available for matters of substance.

The financial transactions cleared through the Bureau of Finance since 1920 have aggregated between eleven and twelve billion dollars in certifications, loans and security approvals. With the Bureau of Traffic more than 93,000 tariff schedules were filed in 1928. The tariff file contains approximately 5,700,000 schedules and supplements, which name literally billions of rates. The Bureau of Valuation is bringing to a close the primary valuations of the carriers and the cost to the government has approximated one-sixth of one percent of the values found. Bringing the appraisal to date is under way, but the expected decision of the Supreme Court in the O'Fallon case will be necessary to clarify the disputes as to principles which have grown out of the increase in costs following the beginning of the war.

The commissioner concluded the study by giving as his deductions:

"For the performance of the huge volume of work which the commission has to do, adequate personnel is a first requisite. This implies adequacy both as to quantity and experience. The turn-over in the forces as well-trained men have left the service has had marked effect upon both the amount and character of the work done. Budgeting of such an organization should be along lines of a continuous consistent policy, and sufficiently liberal that men will be at hand for tasks as they arise, with means to go on.

"Assuming that such conditions apply, then the capacity of the commissioners themselves will be the limiting factor. The organization and manner of work of the commission necessarily must conform to the statute which creates it and directs how it must act. The law lodges both power and responsibility in the commissioners, to be exercised by them personally and not evaded or delegated, except as the law itself permits assignment to a lesser number than a quorum of the entire membership, or to particular agencies. No such permission has been given directly to assign any function either to any individual commissioner or to any subordinate.

"Indirect assignment might be made by the commission itself, under a tacit arrangement that the commission or a division would go through the form of adopting in course the action of a single member or of a subordinate in specified matters which under the law require personal action by a quorum. But this evasion would run counter to the law and would violate the principle of business administration that men should act in their own names and upon their own responsibility. The present state of the law brings the combined efforts of nearly 2,000 employees to the commissioners themselves for the vitalizing exercise of their corporate discretion. More such work is brought to the commissioners than they should be expected to handle. There is no likelihood of diminution in the volume of the work; on the contrary, the probability is that it will increase, and that new duties may be cast upon the commission."

THE EMPLOYEES' VOLUNTARY RELIEF DEPARTMENT of the Pennsylvania paid out, in 1928, total benefits amounting to \$5,230,953. This department is now 43 years old and has paid in benefits and allowances \$101,715,917. The number of members at present is 172,607.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading during the week ended March 9 amounted to 945,770 cars, a decrease of 5,786 cars as compared with loading in the corresponding week of last year and of 54,984 cars as compared with 1927. Smaller loading of grain, livestock, coal and forest products is accountable for the decrease from the total a year ago while all commodity totals, with the exception of grain, coke and miscellaneous freight were smaller than in the corresponding week of 1927. The totals for the Southern, Northwestern and Central Western districts showed decreases as compared with last year. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading

Week Ended Saturday, March 9, 1929

Districts	1929	1928	1927
Eastern	219,090	218,680	234,909
Allegheny	191,878	187,128	210,821
Pocahontas	56,497	53,649	60,915
Southern	148,339	161,384	161,357
Northwestern	112,545	119,020	116,854
Central Western	135,493	136,620	138,932
South Western	81,928	75,075	76,969
Total Western Districts	329,966	330,715	332,752
Total All Roads	945,770	951,556	1,000,754
Commodities			
Grain and Grain Products	41,860	49,544	39,518
Live Stock	23,418	28,077	27,251
Coal	171,536	174,750	220,241
Coke	12,835	11,355	12,648
Forest Products	64,955	67,519	69,915
Ore	10,732	8,921	10,850
Merchandise L. C. L.	259,742	257,916	263,522
Miscellaneous	360,692	353,474	356,809
March 9	945,770	951,556	1,000,754
March 2	976,987	959,494	989,863
February 23	907,337	869,417	918,858
February 16	958,051	888,586	954,794
February 9	955,478	906,477	962,602
Cumulative total, 10 weeks	9,261,493	8,950,687	9,549,195

The freight car surplus during the period ended February 28 averaged 217,400 cars, as compared with 222,287 cars on February 22. The total included 98,986 box cars, 72,613 coal cars, 25,774 stock cars and 9,891 refrigerator cars.

Car Loading in Canada

Revenue car loadings at stations in Canada during the week ended March 9 totalled 65,023 cars, a decrease from the previous week of 4,019 cars and an increase of 2,610 cars over the same week last year.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada		
March 9, 1929	65,023	46,810
March 2, 1929	69,042	48,196
February 23, 1929	65,526	46,449
March 10, 1928	62,413	42,674
Cumulative Totals for Canada		
March 9, 1929	610,902	423,281
March 10, 1928	626,565	388,411
March 12, 1927	603,596	381,853

A NEW RAILWAY POST OFFICE BUILDING was opened at the Birmingham (Ala.) Terminal station on February 19, a large number of visiting postal and railroad officers being present. At this postal station about 150 employees are kept employed.

TEN THOUSAND SEVEN HUNDRED AND FIFTY-FIVE TONS of grain were taken out of Halifax, N. S., on February 14, by a Dutch freighter, the heaviest cargo ever loaded at Halifax and one of the heaviest ocean cargoes, ever loaded on either coast. The grain was destined for Rotterdam and Antwerp.

Government Ownership in Germany

Contrast of operating results under government with those under Dawes Plan provide evidence on comparative efficiency

By Professor Robert M. Weidenhammer
School of Business Administration, University of Minnesota

THE German railroads since the war provide interesting evidence on the question whether in a democratic state railroads should be publicly owned and managed or not. Since the close of hostilities the German railroads have gone through two distinct phases. Until 1924 they were under federal ownership and management, to which they had been transferred by the individual states on April 1, 1920. Since 1924, in accordance with the Dawes plan, they have been operated by a private company controlled by the federal government and the Agent General for Reparations. This company will continue to exist until 1964, when possibly the government may take the lines over again. There is no doubt whatever about the fact that the German railroads under private ownership have proved to be satisfactorily and successfully operated, whereas from 1918-1924 under government operation their deficits grew. Although Germany during that period experienced the catastrophes of the revolution and monetary inflation, and unfavorable railway conditions were partly inevitable, still a more efficient management might have mitigated the disaster, as will be shown in this article.

The price paid by the federal government for the state railways amounted to 40 billion marks. But though the price was at the time considered to be very high, it was in no way the cause of the later deficits, as it was paid in annuities which depreciated rapidly with the mark.

A few data will show the deficits of the German railroads from 1920-1922. (The year 1923 was so chaotic in the depreciation of all values that an exact calculation is impossible.)

German State Railways

Surplus or deficit			
1913.....	surplus	1,000,000,000 marks	= 1,000,000,000 gold marks
1920.....	deficit	13,000,000,000 "	= 900,000,000 " "
1921.....	deficit	7,000,000,000 "	= 300,000,000 " "
1922.....	deficit	188,000,000,000 "	= 175,000,000 " "

Operating Expenses			
1913.....	Operating expenses	= 70 per cent of revenues	
1920.....	"	= 173 per cent " "	
1921.....	"	= 115 per cent " "	
1922.....	"	= 109 per cent " "	

It has already been stated that the deficits of the Reichsbahn (State railways) are not all attributable to the administration. The decrease in traffic reduced revenues, both passenger and freight. The eight-hour day, compulsory in Germany since November, 1918, made necessary a proportionate increase of personnel. The consumption of coal per locomotive and mile showed a 38 per cent increase in 1920 above 1913 on account of the use of heavier engines and inferior quality of coal. A transport tax of 10 to 16 per cent on passenger fares and of 7 per cent on freight rates increased the costs accordingly. It has been said that the effect of these conditions in prewar days would have been to eat up the seven billion marks surplus of the railways. Deficits were due in part to the fact that the personnel was demoralized by the war, that the equipment was to some extent worn out and that there were heavy taxes on all railway materials.

The question is whether, through proper administra-

tion, the deficits could have been avoided or at least reduced in spite of all this. And, as will be explained in the following, there is no doubt that this might have been possible if more stress had been laid on efficiency and profits instead of on the immediate wishes of the people. In other words, the public administration under a democratic government was not guided by policies that would have been followed by private owners or by an autocratic state.

The passenger revenues, even if the diminution by the reduction in mileage (reduced territory) and traffic and by the transportation tax is discarded, in 1920-1924 were 50 per cent and in 1922 were 20 per cent of 1913. The reason for this decline was that passenger rates were not raised in anything like the proportion of the depreciation in the mark, and that passengers used lower classes to a greater extent. Freight revenues in 1920 amounted to 40 per cent, in 1921 to 70 per cent, and in 1922 to 85 per cent of prewar. Computed in gold, all railway rates both for passengers and freight were from 1914 to 1922 lower than they had been in 1913. The policy of the railway administration, i.e. the government, was not to increase the already-too-heavy burden of the people. The railroads in government ownership were looked upon as a public enterprise providing transportation for the convenience of the nation. Little attention was paid to whether a reasonable price was being paid for this convenience or not. As a matter of fact, the whole deficit (13 billion marks) could not have been wiped out by raising rates. The country would have been ruined. But a third of it might have been covered by such measures, if undertaken at the right moment.

Much Revenue Wasted on Transportation Tax

The revenues might have been raised, in addition to this, by discontinuing the high rebates given for long distance, especially for through traffic and by a uniformity in passenger classes. While in 1913 the fourth and third classes showed the same number of passengers, in 1922 the fourth class exceeded the third class three and one-half times. If a uniform class ticket costing about one quarter more than a third class ticket had been issued the receipts would have been the same and the expenses for cars, tickets, personnel for supervision, etc., considerably reduced. Considerable sums were wasted in the railway administration by the fact that the proceeds of the transportation tax, instead of staying with the railway, went to the government treasury, only to return to the railways as loans upon which interest was charged.

Not alone by increasing revenues, but also by cutting down expenses, the deficits of the railways might have been diminished. The main items of expense are wages and material. A reduction of wages was impossible, but a decrease in personnel ought to have been effected.

Number of Employees

1913	741,000
1919	1,122,000
1920	1,090,000
1921	1,051,000
1922-23	999,000

And this with a reduction of traffic and territory. There are several explanations to be found for this; the straight eight-hour day (now modified), the extension of vacations, the time taken by the men for works councils and the weekly instead of monthly pay days. There was more than normal repair work to be done, because of the inferior quality of the material and because of the surrender of 5,000 locomotives, 20,000 passenger cars and 15,000 freight cars to the Allies. In Prussia, the number of repairmen in 1919 was 2.4 times as high as in 1913. The increase in maintenance work was accompanied by a decrease in the efficiency of labor by the war and revolution, and by the prohibition of piece-work from 1918 to 1920. It has been calculated that in 1919 the average employee did only 43 per cent and in 1921 only 60 per cent as much work as in 1913. From 1913 to 1921 there was an increase of 35 per cent in the number of employees, while the work performed fell 18 per cent under 1913. Under the demobilization laws the railways had to employ a large number of incompetent employees (war invalids) and impediments to reducing forces grew in the years following the revolution. Public opinion demanded that all the men returning from the war and finding no work had to be employed and cared for by the government-operated enterprises, which had, in addition, to take over the employees from territories ceded to other nations under the Peace treaty. Just before 1920, furthermore, most of the states raised large numbers of their railroad employees to the rank of officers, and thus forever undismissible. In 1919 377,000 officers and 764,000 workmen were employed and in 1921 there were 445,000 officers and 606,000 workmen,—which means an increase in the ratio of officers to employees from 34 to 42 per cent.

Increased Supply and Fuel Costs

Expenses for supplies had risen from 39 per cent in 1913 to 71 per cent of the total expenses, though the amount purchased had declined. The consumption of coal per locomotive, for instance, rose from 51 lb. in 1913 to 78 lb. in 1919, declining in 1922 to 64 lb. per mile. The causes were use of heavier locomotives, unclean coal and waste of fuel in consequence of the abolition of the premiums for saving coal and oil. The prices for fuel were unstable and disproportionately high on account of the heavy competition among the coal consumers. The fault lay to a great extent with the railroad management, which practiced economy only in wages and always was very lenient towards its furnishers of material. A labor union has estimated the overcharge of the government at 20 per cent. The same situation prevailed regarding manufactured materials and repairs made for the railroad by private firms. The railways might have done all their own repairs and manufactured many of their supplies; and thus might have found work for their surplus employees.

Operation Under Dawes Plan

When the German railroads were taken over by the "Deutsche Reichsbahn Gesellschaft" in 1924 their finances were separated wholly from the government finances and from this moment the company was compelled to make both ends meet, that is, to cover its expenses by its revenues. Above that the railways have to pay their dividends and interest and an annuity of 600,000,000 marks toward war reparations. Failing in this requirement, the Agent General for Reparations has the right to transfer the administration to a commission of the Allies. Thus immediate measures were necessary to remove the deficit, to balance the railroad budget, and, considering the state of affairs in 1924, the management

can be proud to-day of what has been accomplished since that time. For, although passenger rates are 20 per cent and freight rates 30 per cent higher than in 1913, and expenses for wages are 88 per cent and for supplies (coal and iron) 60 per cent higher, the company has, since the separation of the administration from the state, been able to increase fixed investments by 550 million marks out of its earnings. Only the discrepancies in the price level have to this day prevented it from saving more than this.

Forces Reduced

The first measure taken by the Reichsbahn Gesellschaft was the gradual dismissal of 310,000 officers and employees, so that by 1924 only 710,000 employees worked on the railways, 90,000 of whom are war invalids, of 50 per cent efficiency only, and all of whom worked shorter hours than in 1919. The employees dispensed with were partly superfluous from the beginning, or were made so by the introduction of numerous mechanical devices, such as loading machinery for coal, electric elevators and cranes, electric cars, etc. The Kunze-Knorr brake (an automatic brake for freight trains) alone brought about a reduction in force of 19,000 men. Extra workers for the seasonal peaks are engaged temporarily. Outside of the pension funds of the Deutsche Reichsbahn Gesellschaft, "rationalization" is saving 750 million reichsmarks per annum. The Reichsbahn Gesellschaft has decentralized its administration excepting the departments of personnel, finances and central purchases; has done away with as many of the old red-tape practices as possible, at the same time keeping the connections up between the different managements by conferences and commissions. One of the most important branches of the railway administration is finance. The financial officers keep the situation constantly before them by a system under which the daily accounts of every railway office in Germany reach Berlin in less than one and one-half days. These accounts are a good barometer of general business conditions in Germany. From the daily accounts a monthly balance sheet is constructed, instead of the former annual ones. The Reichsbahn Gesellschaft is thus not compelled to work out a fixed budget for a whole year. Only a general outline is made, which is altered according to the monthly status. The fiscal year now runs from January to January, instead of from April to April, which is of great advantage, as the income is in before the construction and rebuilding season begins, and plans can be made beforehand for the work to be taken up in April. In order to give the presidents of the 30 sectional divisions into which the railway is divided the opportunity to know and to act according to whether they have a surplus or a deficit, all divisions are fiscally autonomous and settle accounts with one another. To facilitate its financial transactions the railway company has established its own bank, the Verkehrskredit bank, which brings in annually 35 millions of interest and has the advantage that through the branches of this institution the money works in the same districts in which it has been made and thus helps to keep business in a condition profitable for the railways. The Railroad Company has made minute inquiries into all items of expenses. For instance, the costs of a train-kilometer are divided into:

1. Costs for the locomotives; interest and depreciation.
2. Costs for the cars; interest and depreciation.
3. Costs for coal, water, oil.
4. Costs for wages.

These and all items of cost are ascertained for every district of the system. The headquarters administration calculates from them system averages and gives them to

all departments which are thus able to see where their own costs differ greatly from the average, to inquire into the reasons and to adjust their practices accordingly. The company furthermore sees to it that all other statistics are kept up-to-date with as little cost and as few employees as possible, and has introduced modern tabulating machines for accounting and statistical work. Statistics have been made uniform for the whole country and all pass through one hand in every sectional division and in the central administration so as to prevent duplications.

Purchasing Policies

As the annual purchases of the railway company amount to enormous sums, in 1927 to 1.8 billion marks, the time of placing these orders is significant, since they may influence the market to some extent. The policy of the Railroad Company is to give orders, if possible, at the time when there is an industrial depression, in order to get its material cheaper and at the same time to improve general business. Coal is always bought in summer, so as to avoid the rush in the fall, and to give the mines the opportunity of a more regular and regulated operation. The coal is taken directly into railroad storage instead of being stored first at the mines, only to be removed in the autumn. To the industries furnishing rails, etc., every week a sum of several millions is regularly paid, while they gradually fill the railway orders along with those of other customers. The introduction of the shell buffing mechanism (Hirlsen puffer), a new kind of buffer with a cylindrical shell for the plate, of stronger couplings on account of the heavier locomotives, and the continual replacing of brake shoes, give rise to millions of marks worth of orders to manufacturers. These purchases have been "rationalized" so as to favor the manufacturer and discontinue the practice of firms asking up to 10 per cent more from the railways than from other customers. Great savings are made by the centralization of scrap handling for the purpose of melting it down and regaining pure copper, antimony, zinc, and tin, which metals are then returned to where the material came from.

For the construction of cars, standard models have been introduced with interchangeable parts. The car building factories have under the influence of the Railroad Company been united to form the Deutsche Wagenbauanstalt (German Car Building Works). They work hand in hand, one factory making only frames, another doors, another seats, etc., and one assembling all these parts. Thus the costs of car-production have been reduced considerably since 1924.

Increased Operating Efficiency

The number of passengers handled has increased 19 per cent and freight tonnage 4 per cent since 1919, while the number of miles traveled per passenger is 23 per cent and the average haul of freight 30 per cent higher than before the war. That is to say, not only has the volume of traffic increased but the average haul of both has increased still more. A ton of freight is carried an average of 94.24 miles against 87.84 miles prior to 1913. At the same time 14 per cent fewer trains are being run today than at that time. Net tonnage per freight train has risen 25 per cent and an up-to-date locomotive pulls 42 per cent more than in pre-war times. Technical progress has thus more than caught up with the rising traffic and more transportation is done with equipment. Automatic brakes and other new devices have made it possible to run freight trains at from 19 to 40 m.p.h. and express freight trains as fast as 50 m.p.h. The speed of passenger trains has also been increased considerably. These measures not only save

wages and supply expenses for the trains, but also on the expenses for rails, etc., as the greater the trains' speed the more the traffic which can be handled with the same facilities and new lines are not needed so soon when traffic grows. Attention has been paid also to the shortening of stops and to the rapidity of transfers that are absolutely necessary. On long-distance trains all passengers changing at particular stations are put into particular cars and these are handled to destination in two or more trains as necessary and the changing of trains is thus avoided. Until last October it had been impossible to abolish the four-class system, the first and second classes of which were practically alike, while since the introduction of the new fourth class cars the third and fourth class, too, had become almost identical. The preparations for a two-class system (the distinction being the provision, or lack, of upholstery) were, however, in the fall completed and the system is now in effect. On the long distance runs, especially on trans-continental and other international lines, de luxe equipment has been provided.

Equipment Building Developments

Hand in hand with the "rationalization" of car construction have gone the rationalization and perfection of locomotive building. The Company has in use 22,000 locomotives today, as against 27,000 in 1914. There are among them 15,000 superheated steam locomotives as against 6000 in 1914; 17,000 locomotives are equipped with feed water heaters. As far as possible the number of types of locomotives has been reduced, so that instead of 290 before the war, now 35 to 40 types only are being built. New pulverized fuel-locomotives have boiler pressures up to 800 and even 1500 lb. Experiments with turbo-locomotives continue. The rationalization of freight cars has led to an increase of 38 per cent in the proportion of paying load. The cars for heavy freight carry 50 to 60 tons and have only one ton of dead weight to three tons revenue load, instead of the former ratio of one to two. They also handle more freight on a given length of train. While the unloading of a 1000-ton freight train occupied 24 hours in 1913, the same work is done to-day for certain commodities in four minutes (by reason of the greater use of hopper cars, etc.). The new system of distributing freight cars according to season and business conditions has saved the Company 400 million marks through maximum utilization of existing cars. Great sums have been saved through the general use of the ticket-printing machines at the railway stations. They print the tickets, at the same time automatically adding the receipts for the fares, saving time, employees, and space.

Repair Shops Reorganized

The railway company has since 1924 handled all repairs in its own shops, which have been reorganized in the interest of greater efficiency. In the first place, not all types of locomotives and cars are repaired in the same shops. Different shops specialize on different types, which makes the work and the supply of material easier and the manufacturing process more rapid. Locomotives are repaired quickly by application of new parts, the old ones being repaired afterwards and put in store for other locomotives of the same type. Thus the time in shops has been reduced to an average of 26 days against 110 in earlier years. Thereby the number of shops where locomotives are repaired has been greatly reduced. Employees, specializing on only a few types of equipment are able to work much faster. Sixteen large repair shops have been closed on account of this rationalization. It should be mentioned that the types of up-

holstering and similar material kept in stock for passenger car repairs have been reduced from 5000 to 3000 and, by the two-class system, may be further reduced.

Modern Methods Eliminated Deficits

The German railways, under the new semi-private plan of ownership, have adopted the most modern methods of business administration and thus have been successful in turning red figures into black by lowering the operating ratio. The railways are now able to contribute the largest item of the German reparation payments, in spite of the fact that they are still hampered by the restrictions mentioned. In addition, they have been extremely successful in adjusting themselves to the new transportation situation. They have anticipated the growing competition from automobiles and trucks by running express freight trains and short interval trains in the neighborhood of cities at exceptionally high speed. While in America motor vehicles are cutting heavily into the passenger traffic of the railways, the German railway company has organized practically all the motor coach lines, using them as feeders to its rail lines.

The Loeffler High-Pressure Locomotive

By Dr. Hans Loeffler*

AS the result of favorable experiences obtained with the Loeffler steam pumping system in stationary plants in Vienna, Austria, and Witkowitz, Germany, the German State Railways have ordered a high pressure locomotive equipped with the Loeffler system from the Berliner Maschinenbauanstalt, formerly L. Schwartzkopf, Berlin-Wildau, which will probably be placed in service this summer.

This 2,500-hp. express locomotive develops a steam pressure of 1,760 lb. at a temperature of 950 deg. F.,

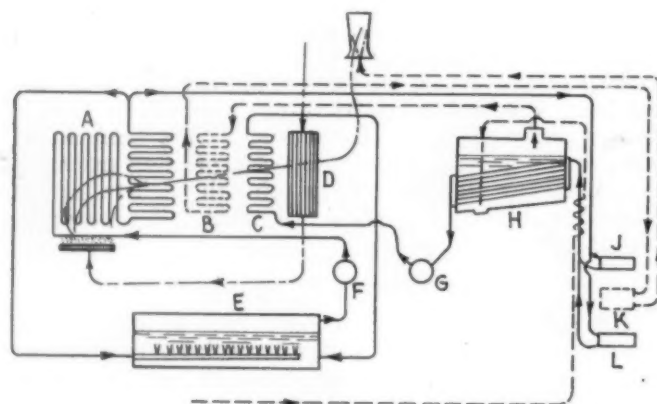


Diagram Showing the Operation of the Loeffler Locomotive

A—High-pressure superheater
B—Low-pressure superheater
C—High-pressure feed-water heater
D—Air preheater
E—Evaporator

F—Circulation pump
G—Feed pump
H—Heat exchanger
J and L—High-pressure cylinders
K—Low-pressure cylinder

and according to experiences with stationary installations and estimates made by the designers, will give a saving of about 50 per cent in coal and water, at a cost not much greater than that of the ordinary locomotive.

* Dr. Loeffler, the author of this article, is a son of the inventor of the Loeffler steam pumping system. A more extensive article, describing in greater detail the high-pressure locomotive to which this system is being applied, will be published in a later issue of the *Railway Age*.

The diagram shows the flow of steam and the relative location of the principal parts.

The furnace gases, as indicated in the diagram, circulate through the firebox, which is formed of superheater tubes, thence through the high-pressure resuperheater *A*, the intermediate superheater *B* for low pressure steam, which operates at about 220 lb., the high-pressure, feed-water heater *C*, the air preheater *D*, and then out through the stack. The low evaporator drum *E* is located at the center of the locomotive. Two vertical triple-crank pump units are used, each of which consists of three superposed three-cylinder piston engines—the feed pump *G*, the low pressure steam engine *K* and the circulation pump *F*.

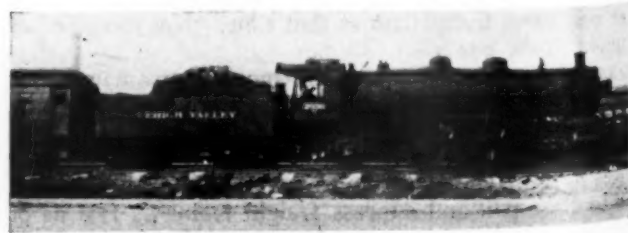
The steam, which is decompressed in the two lateral high-pressure cylinders *J* and *L*, is condensed in a surface heat exchanger *H* and generates low pressure steam from the feed water at about 220 lb. This steam, after expanding in the middle low-pressure cylinder, escapes to the stack through the exhaust pipe, which produces the draft for the furnace gases. The condensed steam on the high pressure side of the heat exchanger is forced into the preheater by the feed pump of the high-pressure boiler and finally into the evaporator. Losses, due to leaks in the high-pressure pure-water circuit, are replaced from the water in the low pressure side of the heat exchanger by a simple by-pass pump.

The heat exchanger provides double storage of heat in water containers which are located on both sides of the heat exchanger walls. Its construction is similar to a simple tubular boiler, which facilitates the removal of boiler sediment. However, in the steam pumping system, the double circulation of water can be omitted without harmful effect on operation of the locomotive. A single container can be used for water and steam in the low-pressure portion as a supplementary heat accumulator, and also as a preliminary boiler-scale remover. The expanded and de-oiled high-pressure steam from the high-pressure cylinder is injected directly into the water in this container, and the low-pressure steam thus produced is expanded in the low-pressure cylinder after intermediate superheating.

Ordinarily, the steam-pumping locomotive will be made ready for service with low-pressure steam, which may be taken from another locomotive or the shop steam line. Where the terminal delay is only a few hours, the pressure in the evaporator will remain sufficiently high so that the locomotive can be operated without auxiliary steam. Also, when first starting the locomotive, the heat exchanger can be heated by an auxiliary heater. This will produce low-pressure steam, which is carried to the steam engines for operating the pumps, and thence to the steam circuit.

The weight and clearances required by the Loeffler locomotive should not be greater than for ordinary locomotives. The external construction should differ only slightly from locomotive types now generally used.

* * *



On the Lehigh Valley at Niagara Falls, N. Y.

Container Hearing at Dallas

*Missouri Pacific tells of economies expected from service—
Questioned as to arrangements with consolidator*

TWO conditions led the Missouri Pacific to investigate the operation of freight container cars and to decide to engage in furnishing this type of service. These were the serious and ever growing loss of short-haul merchandise traffic to the motor truck and the fact that the methods of the railways for handling merchandise freight which have not changed for fifty years are cumbersome and uneconomical. Testimony to this effect was presented by J. A. Brown, assistant vice-president of the Missouri Pacific, at the opening of the Interstate Commerce Commission hearing in Dallas, Tex., on March 18, on the freight container investigation, Docket 21723 and I. & S. 3198, which involves the Missouri Pacific container tariff.

The Commission was represented by Commissioner Claude R. Porter and Attorney-Examiner Harry C. Ames. Sitting with them were members of the Texas Railroad Commission, who accepted the testimony as applying also to the intrastate container tariff filed by the Missouri Pacific and the Texas & Pacific, which was before them. Mr. Brown described the present method of handling merchandise shipments, stating that the freight house and other incidental costs of handling l.c.l. freight average 20 to 30 cents per hundredweight and that in 1927, 25 per cent of the car equipment of the railways was used in handling l.c.l. freight which accounted for only 2.78 per cent of their total tonnage. He emphasized the fact that merchandise cars are usually lightly loaded. The average loading of such cars out of St. Louis on the Missouri Pacific in 1927 was 10,017 lb. and for the railroad as a whole only 6,500 lbs. Mr. Brown also stated that the amounts invested in facilities for handling l.c.l. traffic are out of proportion to the revenue resulting from the tonnage which these facilities are provided to handle.

Basis of Payment to L. C. L. Corporation

Upon investigation of the operation of freight containers by Eastern lines, according to Mr. Brown, the Missouri Pacific entered into a contract with the L. C. L. Corporation, whereby the former leases from the latter 300 steel containers for 10 years, the rental to be two cents a mile for each car carrying one or more loaded containers, but not to exceed six containers, and one cent a mile for each car carrying not to exceed six empty containers. Ordinary maintenance is to be performed by the railroad, which has the right to purchase the containers, if it sees fit, at a reasonable price and on the basis of the payment of annual royalties amounting to \$50 per container for the first 500 containers and half as much for all others. After the original tariff was filed by the Missouri Pacific and was suspended by the Commission on application of several Western and Southwestern trunk lines, the former continued its study of the container plan, including the detail of the rates contained in the tariff. As a result it was decided to adopt a different rate basis which was stated in tariff I. C. C.—A 7379. This tariff the Commission permitted to be substituted for tariff I. C. C.—A 7354. The rates in the later tariff were constructed as follows according to Mr. Brown:

The charge for a container loaded to a weight not exceeding 4,000 lb. is equivalent to the average of the class rates for the first to fourth classes, inclusive, applied to 4,000 lb.; the charges for a container loaded to a weight not exceeding 10,000 lb. are equivalent to Class A rates applied to 10,000 lb. The charges for the containers loaded to the upward-graded weights of 500 lb. each, 4,500 to 9,500, inclusive, were constructed as follows: There is a difference between the charge for a 4,000 lb. container and that for a 10,000 lb. container to be apportioned to the container of other weights. Instead of dividing this sum into twelve equal parts it was established that the charges per 500 lb. on the container contents should decrease as the weight of the container loaded increased. This method rewards the shipper for heavy loading, declared Mr. Brown. He emphasized that the container rates made on this standard formula could and probably would be revised concurrently upward or downward with any change in the class rates, thereby preserving the relationship created.

Mr. Brown introduced a number of exhibits at this point, including a statement of billing expense incident to merchandise handling, estimated container car revenues based on 1928 business and compared with the actual gross and net revenue earned on the merchandise business in that year, the cost of handling l.c.l. freight into merchandise cars, the station costs properly applicable to container car movement, loadings on the Missouri Pacific from St. Louis to all points involved in the suspended tariff for the years 1923 to 1928, inclusive, the ratio of container rates based on 4,000 lb. to each class rate from St. Louis to the points involved, and an estimate of reasonable loadings in containers in handling the same merchandise which was moved in box cars, showing that the earnings on the container cars would be considerably in excess of the earnings on the box cars.

Container Rates Compared with Class Rates

An exhibit was also presented which showed that container rates are not less than fourth class rates until the containers are loaded heavily. The point at which the container rates are less than third class rates is reached when the container is loaded to weights ranging from 5,000 to 6,000 lb. Mr. Brown denied that the establishment of the container rates would destroy the classification and that such elements as value, difference in weight per cubic foot, fragility, etc., entering into the making of classification ratings, have been swept aside. He discussed the latter point at some length, stating that one of the impelling reasons which lead the Missouri Pacific to design the new system of rates was that in the use of container cars such items are entitled to consideration and the shipper who is able to use container transportation is entitled to the benefits which accrue from the fact that these factors thus lose their force. He testified that he anticipated a loading in container cars from St. Louis to an average of two and one-half times the average loading in merchandise cars. This would enable a considerable saving in equipment.

During his cross-examination by representatives of other railroads and of civic and commercial organizations, Mr. Brown testified that operating economies were considered a more important factor in container operation than the possibility of securing traffic that has been lost to motor trucks. Most of the questions raised in cross-examination had to do with individual items of proposed rates in the container tariff, the intent being to show large rate reductions thereunder or inequalities in the container rates themselves. Mr. Brown stated in reply to a question that as fast as conditions warrant the container service will be extended to other stations on the Missouri Pacific lines in addition to those involved in the proposed tariff at issue. Answering a question regarding his statement that container use would reduce freight house congestion, he said that parts of some freight stations involved are now leased to outside organizations. He insisted, however, that additional freight house facilities would be required if some means of relieving the present congestion were not adopted. Mr. Brown said that the Universal Carloading & Distributing Company was expected to be the largest user of the container service but that others would doubtless adopt it also. He denied that the container service actively promoted both by the Missouri Pacific and the carloading company's traffic solicitors would tend to give the Missouri Pacific a monopoly of the l.c.l. business to competitive points. He added, however, that he expected the other railroads to institute container service also if the Commission approves the Missouri Pacific tariff.

Relationship with Car Consolidator

At this point Attorney-Examiner Ames took up the cross-examination, particularly going into the relationship between the Missouri Pacific and the Universal Carloading & Distributing Company, in connection with the container service. In response to questions, Mr. Brown said that the Biddle street station at St. Louis had been selected for the container operation because of its use by the Universal Company, others of the stations to which the original container service is planned to go also being utilized by this company. The Missouri Pacific has entered into no contract with the Universal Company, but has its assurance of its patronage for the proposed container service. At several points the cranes necessary for the handling of containers to and from the gondola cars are operated by the Universal company. When other shippers want the use of these cranes the Missouri Pacific will pay the Universal company twenty-five cents per container moved. Mr. Ames concluded with questions as to the possible effect on jobbers in the Southwestern territory of the institution of rates in the container tariff which might make it economical for some large retailers in Texas, for example, to buy directly from jobbers in St. Louis.

Declining L. C. L. Traffic

The next witness for the Missouri Pacific was W. H. Malcolm, auditor of freight receipts, who presented two exhibits, one showing a declining percentage of l.c.l. traffic to all traffic and the other showing amounts and kinds of merchandise handled during one week in February from St. Louis which might have been handled in containers. In cross-examination he was asked if a substantial part of the l.c.l. traffic loss were not represented by traffic now handled by carloading companies and was not therefore reported under carload traffic. In reply he stated that there had been a decrease in l.c.l. traffic in every year since 1911 but that the l.c.l. tonnage

at stations served by the Universal Carloading Company had increased in the 1923-1928 interval. Both he and E. D. Williams, chief clerk to auditor of disbursements, who was the next witness were cross-examined extensively on their estimates in the exhibits as to the cost of container service.

Following Mr. Williams as a witness was D. O. Ouellett, general superintendent of transportation, who testified that from an operating standpoint the operation of containers would effect a substantial decrease in empty car mileage. He was cross-examined at length on this point by Examiner Ames.

Following the completion of Mr. Ouellett's testimony, the Missouri Pacific called to the stand several shippers who testified in favor of the container method of transportation. They stated that they would use the service if it were put into effect on account of the lower rates which they would enjoy as a result. These witnesses were questioned by Examiner Ames as to their connection or relations, if any, with the Universal Carloading Company, going into the matter to the extent of the use they made of the consolidated service, the rates they paid and the character of the service rendered.

Shippers Oppose the Service

With the testimony of the shippers who favored the Missouri Pacific container tariff, the case of the respondents was completed. For the protestants to the tariff the testimony first presented was that of shippers and representatives of commercial and civic organizations in the Southwest who oppose the proposed tariff. These witnesses in general opposed the tariff on the grounds that it provides for rates which could be enjoyed by only a few larger shippers unless the services of forwarding companies were utilized; that the benefit of such rate reductions therefore would go to the forwarding company rather than to the individual shipper; and that it would react against the southwestern jobber in favor of jobbers in St. Louis and other midwestern or eastern points. These witnesses testified to the effect that they were not opposed to container operation in principle, but that their opposition was to the proposed Missouri Pacific plan of container use.

Examiner Ames continued his examination of shipper witnesses as to their relations with forwarding companies. In one instance he had read into the record evidence of freight charges billed to one shipper which indicated the Universal rate from Chicago to Dallas on toilet preparations was \$2.36 a hundred, as compared with the first class rate of \$2.54.

On Wednesday morning, March 20, the taking of testimony of shipper witnesses against the tariff was interrupted to permit J. R. Koontz, vice-president of the St. Louis-San Francisco, to testify. Mr. Koontz attacked the whole proposition of container operation in the Southwest. The southwestern roads, he said, have spent great sums to build up their equipment to the point where it is equal to the best in the country. If the container tariff were approved, he declared, the other southwestern lines would have to meet the competition and he quoted one railway president as saying that box cars themselves would be used as containers if necessary. Even in the East, where merchandise loads are normally heavy, the roads operating containers have been unable to fill them, he continued, so that it would be unlikely that the southwestern lines with thinner merchandise traffic should be able to attract a substantial container traffic. Charges on merchandise shipments should be revised upward rather than downward as provided in the container tariff, Mr. Koontz said. He

said he understood that the Missouri Pacific would have to invest \$225,000 at Kansas City, Kan., to provide facilities for handling containers and a similar or larger sum at St. Louis. The southwestern lines, he declared, in view of their expenditures for equipment during recent years, cannot stand the strain of an additional capital charge for equipment which cannot be expected to pay its way for a number of years.

[The remainder of the testimony at the Dallas hearing will be reported in the *Railway Age* next week.—EDITOR.]

Traffic Club of Chicago Discusses Consolidation

RAILROAD consolidation and its relation to the shipper, the employee, the stockholder, the banker and the public, was discussed by two railroad presidents, a professor, an editor, and two representatives of shippers at an open forum meeting of the Traffic Club of Chicago on March 18. T. C. Powell, president of the Chicago & Eastern Illinois, in answer to the question "Why Is Consolidation?" said consolidation takes place principally because the attending circumstances demand it. Most consolidations that have taken place in the past have been justified by results. Those that have failed probably did not secure public approval as being necessary and desirable, and this would be an indication that they are not well planned.

In discussing the subject he assigned three values to the railroads: first, the real value, on which to base a rate of return to the stockholders and owners; second, the nuisance value and third, the commercial value. Prior to the passage of the Elkins Act, he explained, the nuisance value was the greatest where the responsibility was the least. Small roads, built without judgment or whose natural traffic had disappeared, undertook to secure competitive traffic by illegal means, and in the past, many railroads were bought or leased by the larger systems simply to remove them from the sphere of influence which these small roads had created by rebates and irregular practices.

A road, he continued, may still have a nuisance value at the present time and keep within the law, because a comparatively small road may, through destructive practices, even though confirmed by tariff, endanger the revenue of the conservatively-operated railroad. The result of such individual concessions may appear to be small in each case but the aggregate influence is sometimes very large.

He founded the commercial value upon the strength which one railroad may bring to another through a consolidation of the two and particularly upon the increased ability of the combined roads so brought together to serve the public and to secure a larger proportion of the traffic. He believed that consolidations of railroads will be successful to the extent that such combinations lay stress upon the commercial value of roads to be acquired rather than upon either their physical or nuisance values or both. A successful consolidation is one which will result in strengthening the new system as a whole as compared with the strength of the separate parts.

The railroads of the United States, he felt, are more effective in a nation-wide distribution of money and material than any other agency not excepting the national government and have, for that reason alone, a

tremendous influence upon prosperity. The more consistently the consolidation plans are carried out looking toward a strengthening of this power of national distribution, the more valuable to the country will such consolidations be.

Consolidations, which result in so reducing the competitive spirit as to ultimately reduce efficiency below the proper standard, are not proper, but the public is more interested in maintaining a high standard with only a reasonable amount of competition than they are in retaining the opportunity of securing special privileges for a particular community or for some particular individual.

H. R. Kurrie's Viewpoint

H. R. Kurrie, president of the Chicago, Indianapolis & Louisville, in discussing the much-talked about "bankers' consolidations" discredited the assertion that bankers sponsored consolidations for the profit resulting, saying that the banker makes more out of a receivership than out of a consolidation. Although bankers can buy stock at a low figure preceding a consolidation, they can also sell at a high figure before a receivership. He felt that consolidations were sponsored because the owners believe that they can make more money by combining and because the customers of the roads believe they will pay less for service. He thought that in the end the shipper would fare worse. He discounted the supposed economies of consolidation, feeling that the larger systems are operated less efficiently because of their magnitude than smaller roads whose management is more concentrated. In England, he said, consolidations were tried and now an attempt to escape is being made through government control.

Mr. Kurrie felt that competition in rates still exists and cited the manufacturer in the south who endeavors to secure rates that will enable him to compete in Chicago with a manufacturer in the east who in turn tries to keep the rate in his favor. Railroads also compete among themselves over the rate structure. With fewer roads, industry will be more concentrated for a man who wishes to locate at a certain point will be influenced by the carrier that may be able to operate less expensively from another point.

Whether consolidations are good depends upon the viewpoint. The cost of improved service may be passed on to the shipper and the elimination of duplicate service may result in curbing competition which in turn will not help the shipper. The reduction in employees will not benefit the working man.

L. C. Sorrell, professor of transportation of the University of Chicago, outlined the history of consolidations since 1840. About this time and until 1870, he said, they were an end to end proposition, the motive of which was to provide through service to compete with water carriers. In the 80's and 90's parallel lines united to eliminate competition and thereby control traffic. About this time the public's attitude was expressed in the Sherman Act and the Interstate Commerce Commission Act of 1887 which prohibited pooling. Several combinations occurred until the Transportation Act of 1920. After government control popular feeling regarding the theory of competition was changed and two forms of pooling were permitted.

Others who addressed the meeting were Samuel O. Dunn, editor of the *Railway Age*, J. P. Haynes, executive vice-president of the Chicago Association of Commerce and J. H. Beek, executive secretary of the National Industrial Traffic League.

I.C.C. Hears Argument on Use of Private Cars

WASHINGTON, D. C.

WHILE denying that the Interstate Commerce Commission has power, under the law, to declare unlawful the practice by which railroads transport private passenger cars, including so-called office or business cars, for each other free or at other than published tariff rates, the Association of Railway Executives has adopted a "code of ethics" for the purpose of eliminating such abuses as may be found to exist, the commission was told during the argument before it on March 14 on the proposed report by Commissioner McManamy on the commission's investigation of the use of private cars.

Alfred P. Thom, general counsel of the Association of Railway Executives, presented a legal argument taking exception to the conclusions of law recommended by Commissioner McManamy relating to the transportation of business cars and also to the transportation of guests in private cars at the rates charged passengers provided only with ordinary coach accommodations.

R. H. Aishton, chairman of the executive committee of the association, also made a statement dealing with the practical aspects of the situation, defending the general practice but stating that after consideration of the McManamy report the association on November 10, 1928, had adopted the code of ethics with a "determination to eliminate from the picture any practice that seems unwise or objectionable."

Having as a basis the understanding that has heretofore prevailed that such movements were made as a courtesy or privilege as between the railroads, he said, the code was adopted limiting such courtesies and it was directed that reports be made monthly of all movements of cars on foreign lines, in order to give opportunity for further study of the situation "with the view—by mutual recognition of the railroads—of keeping the movements within lines wherein there can be no possible criticism on the part of anyone as being contrary to the public interest."

A careful analysis of these movements as shown by the first three months' reports, he said, indicates that only a very negligible part could possibly be subject to any criticism as being contrary to the code of ethics. He suggested that the most efficient use of business cars from both the public and the carrier standpoint rests in a policy which relies on the integrity and good faith of the railroads in carrying out the code of ethics rather than in the imposition of rigid rules and regulations. "The enforcement of the latter might correct abuses," he said, "but they would be almost certain to curtail the legitimate uses of such cars, to the detriment of the public interest. In other words, freedom of use under a proper sense of responsibility is preferable to detailed direction, that, in the very nature of things, cannot anticipate the wide variety of conditions that prevail in a country the size of this."

I. C. C. Argument

Thomas P. Healey, director of the Bureau of Inquiry of the commission, presented the opening argument, briefly supporting the recommendations in the proposed report by Commissioner McManamy which included three conclusions of law, that the transportation of private cars by one carrier for another free or at other than published tariff rates, is contrary to the provisions of the Interstate commerce act and that it is unjustly

discriminatory and unduly preferential and prejudicial to haul such cars for other carriers free, or at less than published tariff rates, while charging certain minimum fares for privately-owned or chartered cars, or to transport persons in private cars, including berths and meals, at the rates charged passengers provided only with ordinary coach accommodations. Mr. Healey contended that there is no justification for the carriage of private cars free by railroads for each other and that the practice results in many inequalities, because the statistics gathered by the commission by questionnaire showed that some roads are called upon to perform such service for others to a much greater extent than others do for them. Examples were also cited of long trips in private cars of railroad officers on which shippers were invited guests and of extensive use of cars by men who were officers or directors of railroads but who apparently used such cars for other than railroad purposes, including trips to summer or winter resorts.

Mr. Thom contended that there is nothing in the law to make transportation of cars for other railroads unlawful and that the commission itself, throughout its administrative life, has recognized in its past regulations and its conference rulings the issuance of passes for officers of other roads, including employees and members of families, with car. Congress itself has stated he said, what classes of persons are entitled to free transportation and did not undertake to limit the kind of carriage that may be given free. He also argued that a private or business car is an instrumentality of transportation, not "property" in the sense of the kind of property to which tariff rates are applied. As to the transportation of guests in private cars, he said that all discriminations are not forbidden but unjust and undue discrimination implies similar circumstances and conditions and the circumstances under which guests are carried in railroad officers' cars are different from those under which ordinary passengers are carried, as they may be invited for purposes of conference or for other railroad purposes.

Mr. Thom also argued that as no hearings have been held in this case no proper foundation has been made for any order, even if the commission had the authority to declare the practices illegal, and he submitted that the findings to be made as the result of the investigation should be that the practices referred to are not unlawful, unjustly discriminating or unduly preferential, except that the question whether or not the transportation of persons in private cars, including berths, at the rates charged for only ordinary accommodations is unjustly discriminatory or unduly preferential and prejudicial must depend upon the facts of each individual case, and can only be found after full hearing.

When Commissioner Eastman asked Mr. Thom to discuss the attitude of the carriers toward some of the "abuses" mentioned in the report Mr. Thom said that the carriers recognize that while there is a lawful power to issue free transportation as a courtesy there have been some abuses and that the Association of Railway Executives has taken action to eliminate them. When Chairman Lewis referred to some of the instances cited in the report Mr. Thom said that whether they constituted abuses would depend on the facts and circumstances, not shown by the statistical record, and he asked that Mr. Aishton be allowed to make a statement.

After explaining the action of the association, Mr. Aishton added a statement from the standpoint of personal experience, saying he had probably made as much mileage in office cars as any railroad officer in the country, and that he desired to express his own views with-

out undertaking to express those of the railway executives on the matter because he had had no opportunity to discuss details with them.

When Commissioner McManamy asked how it was proposed to enforce the code of ethics, Mr. Aishton said that the association has no police power and that there is no law but that it is proposed to obtain observance of the code through education. He said that from the monthly reports he selects examples which on their face seem contrary to the code and places them before the advisory committee. He emphasized that the reports alone do not always indicate the true circumstances, but said that the reports are being studied for the purpose of seeing whether the code should be extended.

"It is my firm belief" Mr. Aishton said, "that no proper opportunity should be denied railroad officers for conferring with their patrons and their owners on the same basis and terms that every other line of business confers with its trade associates, with its patrons and with its owners. In this modern world the club, the golf course and the luncheon are recognized mediums for getting together and settling a great many of the important affairs of business that are never heard of inside an office. The use of business cars happens to be a means that, from the nature of their work and their employment, can be used most advantageously by railroad officers for these purposes in their travels through the different communities and meeting with the different people along their lines. The closer relation that exists between the railroads and the shippers, and the greater opportunities for conferring and discussing their mutual problems, the better it seems to me the public interest will be served.

"Please understand, I am not attempting to defend any abuses, (if there are abuses) that may exist, but let us be sure they are real abuses and against the public interest before we criticize too severely, and if there are abuses you may be assured the railroads will recognize them, and this will develop as time goes on.

"I have no doubt the commission itself recognizes the beneficial results that would ensue if it could take a day off occasionally to meet some of the people whose business it is regulating and that, in this way, it might get a much more intimate aspect of the conditions with which it is compelled to deal, and learn many things that statistics do not accurately portray."

During Mr. Aishton's statement as to the need for the transportation of business cars on other roads Commissioners Eastman and McManamy said the question is not as to the use of the cars but only as to whether each road should not pay for the service it receives so as to equalize the matter because some roads now perform much more of such service for others than they receive. When Commissioner McManamy asked Mr. Aishton if he could suggest any way of ironing out inequalities, Mr. Thom said it was contended that it is not within the legal power of the commission to deal with the matter. Mr. Aishton said he did not think courtesy could be measured by mileage.

To show the progress that is being made Mr. Aishton said that while in December the reports included 31 cases of use of office cars that seemed contrary to the code, in January there were only 21 and in February only 6, and that better information might disclose that these represented travel on company business.

W. H. Lyford, vice-president and general counsel of the Chicago & Eastern Illinois, said that because the situation of this road in relation to powerful competitors it is important for its officers to make many trips

off the line in business cars and that any requirement that it pay for such service would represent a discrimination against a short line. He said that he did not think the commission could legally carry out the recommendations of the report but recognized that it might get the law changed. Commissioner McManamy asked if the C. & E. I. is not used a great deal as a "race-track to Florida" and Chairman Lewis asked if the C. & E. I. does not perform more of such service for others than it receives. He said that statistics in the report so indicated but Mr. Lyford said he did not think the statistics represented an average condition because the latest report he had seen indicated the opposite situation.

Cost of Rebuilding Cars A Capital Account

WASHINGTON, D. C.

DIVISION 4 of the Interstate Commerce Commission has issued a decision construing the accounting rules of the commission in their application to the rebuilding of 1,400 freight cars of the Chesapeake & Ohio at a total cost of \$1,697,527, affirming the previously expressed view of the Bureau of Accounts and an informal opinion of the commission that the cars should have been treated as having been "retired from service and replaced with property of like purpose" and that the expenditures should be accounted for in accordance with the requirements of paragraph 9 of section 2 of the general instructions governing the Classification of Investment in Road and Equipment, issue of 1914, instead of charged to operating expense in account 314.

The Bureau of Accounts questioned the carrier's accounting and after exchange of correspondence and conferences the commission had expressed the opinion informally that the bureau's view was correct. The carrier then requested a formal hearing, which was held on February 25, 1929, at which there was placed in evidence a stipulation of facts. From this it appears, the report says, that between July 29, 1926 and August 21, 1928, the company contracted with the Richmond Car Works and the American Car & Foundry Company for the rebuilding of 2,390 70-ton hopper-bottom gondola cars, all of which work, except that on 35 cars, had been completed previous to January 1, 1929. The cars were built in 1916 and 1917, at a cost in the former year of \$1,500 per car and in the latter year of \$2,000 per car. As the cars were delivered to the shops, the bodies and underframes were removed and cut up for scrap. The trucks were carried to another part of the shops where they were reconditioned by the replacement of all broken or worn-out parts. Contemporaneously with the repairs to the trucks, new bodies and underframes were fabricated in the shops and were later applied to the repaired trucks. It was stated that so far as the records of the carrier disclose, and so far as is known, none of the car bodies or underframes so removed had been destroyed or materially injured.

The commission's letter of January 18 expressed the opinion that "when a car has been dismantled to the extent indicated it has been demolished within the meaning of our classification and should be accounted for accordingly" and that it was desired that the adjustment of the accounts be made for the year just closed. The decision states that nothing since placed in the record affords any ground for a change of the views.

New Books

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Railroad Consolidations and Unifications (Adventures in Benevolent Absorption), by T. C. Powell. "So far as I have been able to find, no other country has had any such dread of the results of consolidation as has had the United States." p. 2. 40 p. Publisher not given, but probably available from Chicago & Eastern Illinois Railway Co., Chicago, Ill. Apply.

Pere Marquette, by Agnes Repplier. A fine biography of the explorer of the Mississippi river, whose travels and transportation problems may be of interest to railroaders on the road that bears his name, or those with the name of his companion, Joliet, connected with them, or those now traversing the territory through which he was the first white man. 298 p. Pub. by Doubleday, Doran & Co., Garden City, N. Y., \$3.00.

Biographical Directory of the American Congress 1774-1927, compiled by Ansel Wold. Sketches of every man and woman who has served in Congress from the Continental through the 69th, making an unusually valuable source of historical data, with railroad services when there were any noted. Louis McLane, for example, "a Representative and a Senator from Delaware" and so on has a line "president of the Baltimore & Ohio Railroad Co. 1837-1847" (p. 1271). Illustrated. House Doc. 783, 69th Cong., 2d sess. 1741 p. Pub. by U. S. Govt. Print. Off., Washington, D. C., \$4.50.

Periodical Articles

On Long Island's Worst Ten Acres She Runs a Model Farm, by Robert H. Denehey. "Esther Loring Fullerton who succeeded her husband as Director of Agriculture of the Long Island Railroad." *American Magazine*, April 1929, p. 73-74.

The Commercial Motor Vehicle and the Public, by M. H. Hunter. "Undoubtedly we are approaching a new era in the regulation of commercial motor transportation . . ." p. 245. Discussion by William M. Duffus, p. 246-251. *American Economic Review Supplement*, March 1929, p. 236-245.

The Regulation of the Common Carrier Motor Vehicle with Respect to its Competitive Aspects, by Henry R. Trumbower. "At the outset it is interesting to compare the conditions under which the early railroad regulatory laws were passed and later the public utility laws, with the circumstance under which regulatory laws were enacted applying to highway common carriers." p. 226. *American Economic Review*, March 1929, p. 226-235.

The Early History of Preferred Stock in the United States, by George H. Evans, Jr. "During the earliest days of the corporation in the United States the holder of each share of stock received the same dividend as the holder of any other share in the same company. This condition soon disappeared in the transportation industry, for in this field the preferred stockholder appeared at an early date—much earlier than has been supposed." p. 43. Baltimore & Ohio Railroad and Chesapeake & Ohio Canal Co. preferred stocks of the 1830's described on pages 43-48, and those of other railroads too numerous to list, p. 49-57. *American Economic Review*, March 1929, p. 43-58.

POLICE OFFICERS of the Chesapeake & Ohio in the year 1928, arrested 2,801 persons and had them taken before the courts for various offences; and only two out of each thousand escaped conviction. The total sentences aggregate 792 years and 10 months, and the total amount of fines imposed was \$40,410. The percentage of convictions obtained in the courts in the month of December, was 99.8 per cent.

Looking Backward

Fifty Years Ago

The whole line of 468 miles of the Pittsburgh, Ft. Wayne & Chicago between Chicago and Pittsburgh, with the exception of 68 miles, is now laid with steel rails, as is also the entire 501 miles of the Pittsburgh, Cincinnati & St. Louis [both now parts of the Pennsylvania] between Pittsburgh, Cincinnati and Indianapolis.—*Railway Age*, March 20, 1879.

Following the purchase by Union Pacific interests of a majority of the capital stock of the Kansas Pacific [now part of the former road] the board of directors of the Kansas Pacific has resigned and their places will be filed by directors elected in the interest of the Union Pacific.—*Railway Age*, March 20, 1879.

The Cleveland, Columbus, Cincinnati & Indianapolis [now part of the Cleveland, Cincinnati, Chicago & St. Louis], according to the report of its operations during 1878, derived 80 per cent of its entire freight traffic from through freight. On this the average rate received was only 0.613 cents per ton per mile while on all freight the gross revenue was but 0.752 cents per ton per mile. Only the Philadelphia & Erie [now part of the Pennsylvania] reports a lower rate in 1878—0.628 cents per ton per mile. The through traffic eastbound on the C., C. & I. was about five times as great as that westbound.—*Railroad Gazette*, March 21, 1879.

Twenty-Five Years Ago

Of the total of more than 100,000 steel freight cars now in service in the United States, less than 12,000 are the property of western railroads.—*Railway Age*, March 25, 1904.

Gross earnings of 63 railways in Texas increased 6.57 per cent in the year ended June 30, 1903, while operating expenses increased 13 per cent, operating income decreased 16 per cent and the ratio of operating expenses to gross earnings rose from 77.78 to 82.48, according to the annual report of the Texas Railroad Commission.—*Railway Age*, March 25, 1904.

In a circular to shareholders of the Northern Securities Company, James J. Hill, president, announces that in order to comply with the decree of the United States Supreme Court the directors have decided to reduce the capital stock by 99 per cent, or from 3,954,000 shares to 39,540 shares. Each share of Northern Securities stock will be exchanged for Great Northern stock valued at \$30.17 and Northern Pacific stock valued at \$39.27.—*Railway Age*, March 25, 1904.

Ten Years Ago

Clyde B. Aitchison, of Oregon, has been elected chairman of the Interstate Commerce Commission in accordance with the custom of rotating its members in the chairmanship in the order of seniority.—*Railway Age*, March 21, 1919.

A total of 119 railroads out of a list of 189 Class I roads under federal control earned less than the amount of their standard return during 1918. Including the 65 carriers that earned an income greater than the standard return, the net result was a deficiency for Class I roads of \$202,135,602 as compared with a standard return of \$890,335,685.—*Railway Age*, March 21, 1919.

The immediate problem of financing temporarily the obligations of the Railroad Administration to the railroads and to the equipment companies now appears to be solved. The Administration is to issue warrants to the railroads to enable them to meet interest and dividend payments. The War Finance Corporation has loaned \$50,000,000 to the Railroad Administration to replenish working capital in the hands of federal treasurers, while the Navy Department has made a payment of \$10,000,000 on account of the money it owes the Administration; and efforts are being made to collect \$10,000,000 that is due from the War Department.—*Railway Age*, March 21, 1919.

Odds and Ends of Railroading

Biggest Paint Job?

The Canadian National advances the repainting of its Quebec bridge, spanning the St. Lawrence river, as one of the biggest paint jobs on any railway. That there is something to the argument is indicated by the fact that 7,500 gal. of paint are required to give the bridge a single coat, and each of the four main piers requires 70 gal. additional. It takes 35 men three years to do the job, working steadily from June 15 to September 15 each year.

A Sequel to "Off Again"

A number of years ago Engineer Donohue, of the Missouri Pacific experienced a breakdown of his engine on the Kickapoo grade. He went to the telegraph office and sent the master mechanic, W. T. New, the following message, which bids fair to outclass the famous "Off Again, On Again." Here is the message: "Mr. New, number two has busted her flue, while going through Kickapoo. What would you have me do? Donohue."

A New Iron Horse

A unique fire fighting outfit has been installed by the Anglo-Persian Oil Company on its rail lines. It consists of a truck body, with wheels fitted with flanges for use on rails. It has a capacity for 425 gallons of "Foamite," the solution used in fighting fires. The entire outfit resembles somewhat the large tank trucks used to spread oil on roads. When rushing to the scene of a fire the machine is capable of making over 30 miles per hour.

Chalk Up Another Point for Conscience

The conscience fund of the Pennsylvania has received another and unique contribution. This time it's a monkey wrench. A man who worked in the freighthouse at Springfield, Ohio, in 1917, called on the foreman the other day and returned the wrench, which he had "borrowed" 11 years ago. He explained that his conscience bothered him.

Champion of the Links

William M. Fredericks, baggageman for the Pennsylvania at Lima, Ohio, claims the sausage-eating championship of the world. Recently, on a bet, Bill ate three pounds of country sausage at one sitting, with half a loaf of bread, and his time was 50 minutes flat. Strange as it may seem, Bill was at work the next day, the same, or practically the same, as usual.

A New Version of an Old Tale

The postman who went for a walk as a diversion on his holidays might compare notes with Samuel Olsen, New York Central track walker, who, eastern papers report, decided to get some recreation on his day off by walking on the tracks of the Interborough Rapid Transit. While examining the ties and rails a train struck him. He was taken to a hospital for treatment of his injuries.

From Here and There

Twin Falls, Idaho—Rates on rabbit meat have been cut to place them on a parity with poultry.

Oslo, Norway—The shortest station name contest missed an important bet in the town of A, which would take the prize, but for its unfortunate situation on a small island, out of the reach of the railways.

Sunbury, Pa.—H. W. Shultz, car inspector for the Pennsylvania here since 1889, recently inspected his three millionth freight car.

Lexington, Ky.—Captain John W. Throckmorton, 84 years old, station master for the Louisville & Nashville, at Lexington, Ky., claims to be the oldest station master in active service.

Jefferson City, Mo.—Governor Caulfield has recognized the Frisco by the appointment of two Frisco men as colonels on

his staff, J. E. Hutchinson, vice-president in charge of operations, and Arthur Stoehr, an accounting department employee.

Washington, D. C.—The Missouri-Kansas-Texas is represented in the U. S. Army's honor guard to the President by Richard W. Bandell, son of a switchman at Franklin, Mo.

Urbana, Ill.—Eugene Cecil of this place, the air-mail flyer who was killed when his plane crashed in West Virginia, was a locomotive fireman on the Chicago & Eastern Illinois, until a year and a half ago.

Mysterious Disappearances

Railways, in bulk, would seem among the safest of possessions to leave lying about without fear of their disappearing, but a Bucharest newspaper reports that when officials went recently to inspect a temporarily disused track between Clui and Jacobeni they discovered that not only the rolling stock but the rails, and even the sleepers, had completely vanished. Nor is such a feat without its precedents. Five years ago, French war office officials were sent to overhaul a railway constructed during the war along a valley near Albert, and searched for it in vain. The only information they obtained was that certain "foreigners" had appeared in the neighborhood some time before and removed the rails and fittings. Central Europe reported yet another case, a year or two earlier. The railroad which ascends a steep mountain side at Kahlenberg was closed during the war for lack of tourists. When officials went to overhaul and put it in working order again, all they found was one of the big cogs of the funicular. —Manchester Guardian.

Breeches, O.D., Cans, G.I. and Cars, Flat

Many an ex-member of the railway engineer battalions, A. E. F., will remember the forms and procedure used by the supply departments of the army in keeping a record of all kinds of supplies and materials. The following, clipped from a recent issue of The Reserve Officer, the official publication of the Reserve Officers' Association, shows that the army has evidently not changed its system of itemizing materials, since those adventuresome days of *vin rouge*, and 40 and 8:

While the army escort wagon, the famous or infamous army mule and army trucks are well known to all, it is not so generally known that the army also engages to quite an extent in railroad operation as one of the means for its transportation.

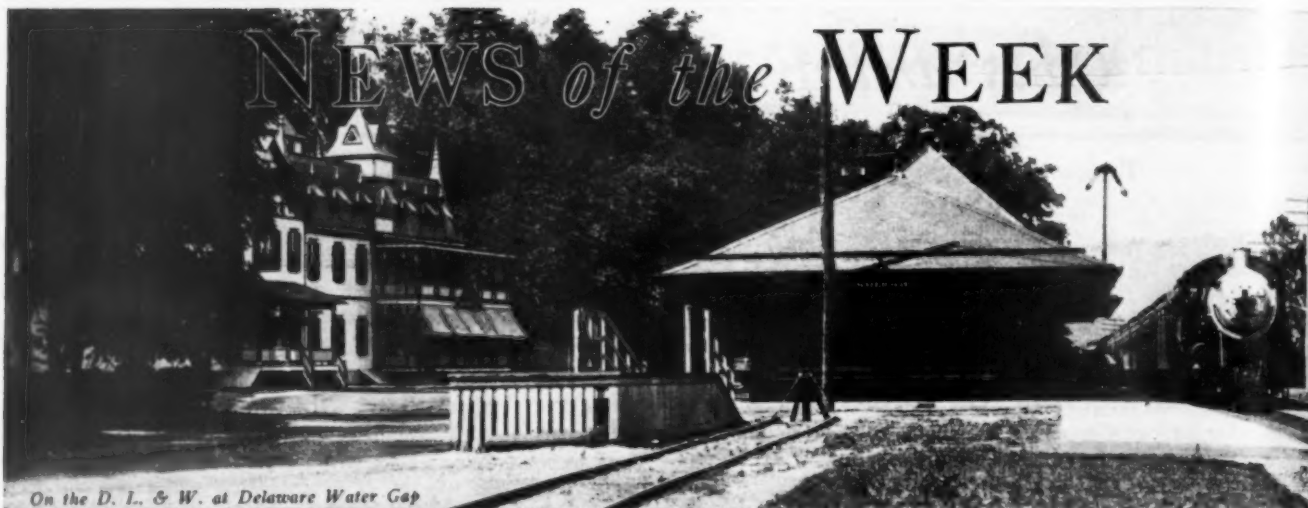
During the fiscal year 1928 railroad equipment was in use at the various stations in the following amount:

Locomotives	81
Cranes	80
Four-wheeled drive trucks	13
Cars, flat	233
Cars, dump	120
Cars, gondola	57
Cars, box	28
Cars, passenger	58
Cars, motor scooter	13
Cars, push and lever	45
Cars, tank, narrow gage	4
Cars, tank, standard gage	396
Cars, Helium gas tank	2

For the repair and maintenance of this equipment, railroad repair shops have been established at Fort Benning, Georgia, and Fort Monroe, Virginia. During the year the following equipment was repaired at these stations at a saving of \$39,376 over the commercial price for the same work:

Locomotives	19
Locomotive cranes	7
Coaches	26
Flat cars	41
Dump cars	23
Gondola cars	40
Box cars	6
Tank cars, narrow gage	14

It is interesting to note that the army was able to save \$39,376 during 1928, on repairs and maintenance to its railroad equipment. This statement should never have been published. Evidently the general staff is unaware of the recapture provisions of the Transportation Act.



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NEWS of the WEEK

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Machinists, boilermakers, blacksmiths, sheet metal workers, electrical workers, car men, engine inspectors, operators of bolt machines, bulldozers, pneumatic hammers and annealing furnaces, babbittmen, lagers and clampmen, and cranimen and crane directors now receiving 59 cents or more per hour have been given an in-

crease of 5 cents an hour. Helpers, regular and helper apprentices and helpers on babbitt fires and cranimen and crane directors now receiving less than 59 cents an hour and power plant engineers were given an increase of 3 cents an hour. The wages of junior helpers, coach cleaners, power plant firemen and other power plant employees were advanced 2 cents an hour. Piece work checkers' wages were advanced \$10 a month while the earnings of piece workers were increased 5 per cent.

The wages of 2,030 mechanics, helpers and apprentices in the locomotive and car departments of the Texas & Pacific have been increased by an amount which will add \$206,500 to the railroad's annual payroll expenditure, effective March 1. The increase affects 900 mechanics, who will receive an addition of five cents an hour; 145 semi-skilled mechanics, four cents an hour; 815 helpers, three cents an hour, and 170 apprentices, from one to three cents an hour. The advances are made under an agreement which will remain in effect for one year.

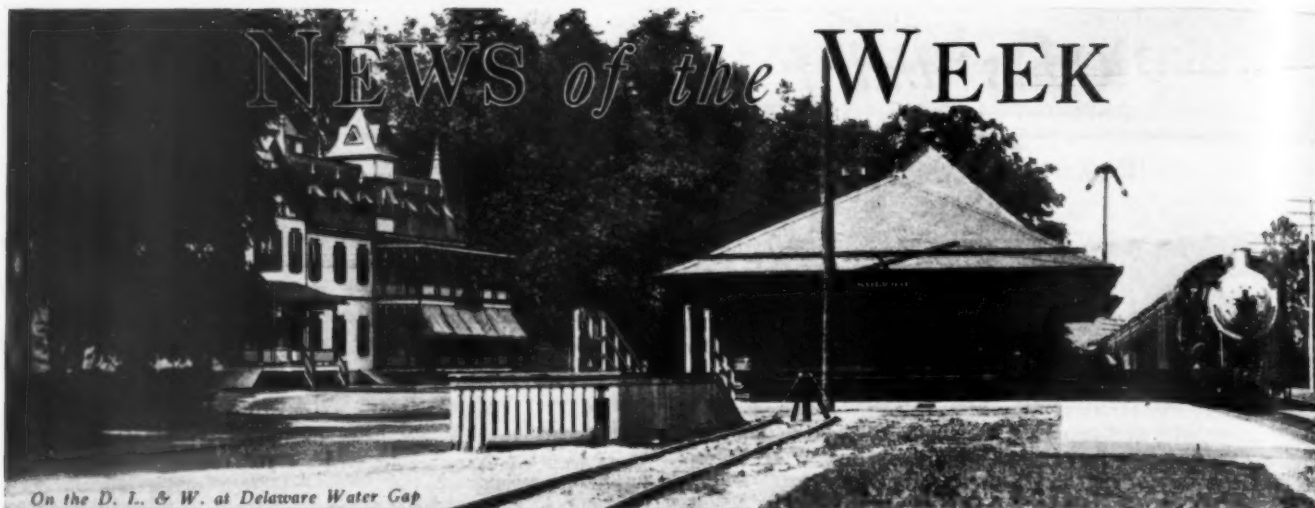
Apple Prices and Rates

Nearly one-half of the world crop of apples is produced in the United States, according to a bulletin on apple production, issued by the Bureau of Railway Economics.

Apples from the United States are distributed to all parts of the world, reaching 72 different countries. The United Kingdom was the largest market for fresh and canned apples and Germany for dried apples. Over 93,000 cars of apples were shipped by rail from the producing areas to markets in this country in the year ending June 30, 1928. Apples from the Northwest reach all of the states, while those from the Eastern and Central states reach practically the entire territory east of the Rocky Mountains.

Figures covering the 66 most important markets in the country show that apples from the state of Washington reached all of these markets, those from Oregon reached 55, and those from Idaho 54. Apples from Washington, Oregon and Idaho, in many instances, traveled over 2,500 miles to market. Apples from the state of Washington predominated in New York City. This wide distribution of apples shows conclusively that freight rates do not restrict their movement.

Prices of apples fluctuated continuously during the past three years. The spread between the low and high prices was often several times the freight rate on a box, bushel or barrel of apples from producing areas to market. The difference between the low and high price at New York City for apples produced in the state of Washington during the 1927-28 season was \$2.09 per box, and at Chicago \$2.83. This spread at New York in the daily average prices was about two and three-fourths times the freight rate on a box of apples shipped from any point in Washington. The ratio to freight rates of the spread in prices of individual sales was still greater. As freight rates were practically unchanged throughout the periods covered, they were in no way responsible for the ever-changing price situation.



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Shop employees on the Chicago, Rock Island & Pacific and the Chicago, Rock Island & Gulf were granted an increase in wages ranging from 2 cents to 5 cents an hour through the signing of an agreement between representatives of those railroads and the Association of Rock Island Mechanical and Power Plant Employees at Chicago on March 9. The agreement affects about 7,020 shop and power plant employees and 270 coach cleaners; and it became effective on March 16. The maximum wages to be paid under the new schedule will be 81 cents an hour.

Machinists, boilermakers, blacksmiths, sheet metal workers, electrical workers, car men, engine inspectors, operators of bolt machines, bulldozers, pneumatic hammers and annealing furnaces, babbittmen, ladders and clampmen, and crane men and crane directors now receiving 59 cents or more per hour have been given an in-

crease of 5 cents an hour. Helpers, regular and helper apprentices and helpers on babbitt fires and crane men and crane directors now receiving less than 59 cents an hour and power plant engineers were given an increase of 3 cents an hour. The wages of junior helpers, coach cleaners, power plant firemen and other power plant employees were advanced 2 cents an hour. Piece work checkers' wages were advanced \$10 a month while the earnings of piece workers were increased 5 per cent.

The wages of 2,030 mechanics, helpers and apprentices in the locomotive and car departments of the Texas & Pacific have been increased by an amount which will add \$206,500 to the railroad's annual payroll expenditure, effective March 1. The increase affects 900 mechanics, who will receive an addition of five cents an hour; 145 semi-skilled mechanics, four cents an hour; 815 helpers, three cents an hour, and 170 apprentices, from one to three cents an hour. The advances are made under an agreement which will remain in effect for one year.

Apple Prices and Rates

Nearly one-half of the world crop of apples is produced in the United States, according to a bulletin on apple production, issued by the Bureau of Railway Economics.

Apples from the United States are distributed to all parts of the world, reaching 72 different countries. The United Kingdom was the largest market for fresh and canned apples and Germany for dried apples. Over 93,000 cars of apples were shipped by rail from the producing areas to markets in this country in the year ending June 30, 1928. Apples from the Northwest reach all of the states, while those from the Eastern and Central states reach practically the entire territory east of the Rocky Mountains.

Figures covering the 66 most important markets in the country show that apples from the state of Washington reached all of these markets, those from Oregon reached 55, and those from Idaho 54. Apples from Washington, Oregon and Idaho, in many instances, traveled over 2,500 miles to market. Apples from the state of Washington predominated in New York City. This wide distribution of apples shows conclusively that freight rates do not restrict their movement.

Prices of apples fluctuated continuously during the past three years. The spread between the low and high prices was often several times the freight rate on a box, bushel or barrel of apples from producing areas to market. The difference between the low and high price at New York City for apples produced in the state of Washington during the 1927-28 season was \$2.09 per box, and at Chicago \$2.83. This spread at New York in the daily average prices was about two and three-fourths times the freight rate on a box of apples shipped from any point in Washington. The ratio to freight rates of the spread in prices of individual sales was still greater. As freight rates were practically unchanged throughout the periods covered, they were in no way responsible for the ever-changing price situation.

Government Control of Stock Issues in Canada

Giving many reasons why the Canadian Pacific Railway opposed the proposed change President E. W. Beatty of that road appeared last week at Ottawa before the House Committee on Railways and Canals and submitted a comprehensive statement on the probable effects of an amendment to the Railway Act, proposed by Charles A. Dunning, Minister of Railways and Canals, the purpose of which was to provide that any company under the jurisdiction of the Dominion Railway Board must obtain the approval of the Board before any disposition is made of any increased capital stock. The proposed amendment was defeated by the committee by a large majority only five or six voting for it, and one of those opposed, Col. Thomas Cantley, of Pictou, N. S., denouncing the proposed change as "another piece of paternalism".

Summarizing, Mr. Beatty said:

"1. That the Canadian Pacific is the only large railway company in Canada which would be affected by the amendment and there has been no quarrel with the methods adopted by its directors in issuing and disposing of capital stock.

"2. That there has, so far as I am aware, been no abuse in Canada in public utility stock issues, they all having been issued at par or at a premium.

"3. That the Board of Railway Commissioners should not be saddled with responsibility for matters of expenditure and finance, which properly come under the jurisdiction of the directors and shareholders.

"4. That such an amendment involving an inference that shareholders have no rights that are peculiar to part owners in a property cannot but depress the value of the company's stock in the minds of possible investors.

"5. While no legal responsibility would rest upon the government or the Railway Commission in consequence of fixing the price, the purchasers of the stock would inevitably look to the government and the Commission to see that earnings were permitted that would maintain the market value to the level of the price fixed."

Alabama Floods Interrupt Train Service

Unprecedented high water from overflowed streams in Southern Alabama caused interruption to the operation of trains on the main line of the Louisville & Nashville between Montgomery, Ala., and Mobile, beginning early on March 14. Water from Sepulga creek and its tributaries flooded the tracks to a depth of from 12 ft. and over for a distance of 12 miles, north of Evergreen, Ala. Murder creek and other tributaries of the Conecuh river overflowed their banks so that the track from a point two miles south of Evergreen to a point four miles north of Flomaton, Ala., 32 miles, was covered with water to a depth of from 8 to 25 ft. Along this section of line the towns of Castleberry, Ala., and Brewton and a number of intermediate stations were flooded with backwater. On March 18 the water was reported to be receding and it was expected that through service on the main line would

be restored on the afternoon of March 20. The Escambia river flooded the town of Flomaton and on March 18 water still covered the L. & N. track near Pinebarren, Fla.

North of Montgomery the flood stage in the Alabama river reached the top of the subgrade but did not flood the track or interfere with the operation of trains into Montgomery. Flood waters from the Black Water, Yellow and Choctawhatchie rivers washed out sections of the L. & N. line to River Junction, Fla. The branch from Georgiana, Ala., to Graceville, Fla., was damaged by water near McKenzie, Ala., and also by the Conecuh river between Andalusia, Ala., and River Falls; and by the Pea river near Samson, Ala., and the Choctawhatchie near Geneva, Ala. On the latter two branches water still covered the track on March 18 and at that time it had not receded sufficiently to make it possible to estimate the date on which service could be restored.

On the Seaboard Air Line, train service had to be suspended between Montgomery, Ala., and Americus, Ga. Passengers were sent from Montgomery by way of Birmingham and the Central of Georgia. It was expected that the breaks in Seaboard Air Line tracks would be repaired by the nineteenth.

The Central of Georgia suffered from washouts on its lines to Lockhart, to Andalusia, and to Ozark. The line between Columbus, Ga., and Union Springs, suffered numerous washouts but service was restored between Columbus and Troy, (Ala.) on the eighteenth.

Operating Revenues and Operating Expenses of Class I Steam Railways in the United States

Compiled from the Monthly Reports of Revenues and Expenses for 183 steam railways, including 16 switching and terminal companies FOR THE MONTH OF JANUARY, 1929 AND 1928

Item	United States		Eastern District		Pocahontas Region		Southern Region		Western District	
	1929	1928	1929	1928	1929	1928	1929	1928	1929	1928
Average number of miles operated	241,291.19	240,430.07	59,926.02	59,837.38	5,633.30	5,620.92	40,145.64	40,024.87	135,586.23	134,946.90
Revenues:										
Freight	\$366,838,464	\$337,960,098	\$161,113,790	\$145,166,516	\$20,247,381	\$17,899,225	\$49,103,095	\$47,477,727	\$136,374,198	\$127,416,630
Passenger	74,986,687	678,642,497	38,899,621	40,265,211	1,406,458	1,589,631	10,276,267	11,372,116	24,404,341	25,415,539
Mail	9,282,550	7,819,912	3,554,885	2,922,802	245,407	211,947	1,347,279	1,183,322	4,134,979	3,501,841
Express	9,096,634	8,137,953	4,180,392	3,567,235	187,551	204,230	1,333,724	1,116,339	3,394,967	3,250,149
All other transportation	16,214,321	15,415,656	9,140,299	8,562,303	167,439	164,999	951,056	926,207	5,955,527	5,762,147
Incidental	9,855,146	9,511,948	5,193,536	4,973,009	261,389	337,159	1,135,335	1,168,937	3,264,886	3,032,843
Joint facility—Cr. ..	1,060,893	1,096,130	366,230	458,362	7,462	10,483	144,315	124,431	542,886	502,854
Joint facility—Dr. ..	307,467	375,397	77,215	137,792	4,684	2,818	27,726	29,610	197,842	205,177
Railway operating revenues	487,027,228	458,208,797	222,371,538	205,777,646	22,518,403	20,414,856	64,263,345	63,339,469	177,873,942	168,676,826
Expenses:										
Maintenance of way and structures	58,351,506	58,505,833	25,017,021	25,110,095	2,892,495	2,895,903	8,885,582	8,921,170	21,556,408	21,578,665
Maintenance of equipment	100,158,544	97,711,500	47,878,012	45,397,686	4,708,788	4,511,998	12,513,707	12,947,057	35,058,037	34,854,759
Traffic	10,655,426	10,491,732	3,962,776	3,838,737	286,489	284,318	1,883,775	1,968,747	4,522,386	4,399,930
Transportation	179,853,915	177,235,177	84,462,192	82,811,536	5,806,197	5,844,345	22,871,542	23,660,322	66,713,984	64,918,974
Miscellaneous operations	4,807,735	4,668,999	2,296,515	2,246,745	71,520	81,919	580,579	593,954	1,849,121	1,746,381
General	16,259,891	16,340,201	7,083,392	7,342,057	603,922	622,888	2,142,659	2,107,748	6,429,918	6,267,508
Transportation for investment—Cr.	747,461	962,753	115,534	168,684	5,334	12,919	69,100	97,951	557,493	683,199
Railway operating expenses	369,339,556	363,990,689	170,584,374	166,578,172	14,364,077	14,228,452	48,808,744	50,101,047	135,582,361	133,083,018
Net revenues from railway operations	117,687,672	94,218,108	51,787,164	39,199,474	8,154,326	6,186,404	15,454,601	13,238,422	42,291,581	35,593,808
Railway tax accruals ..	31,312,918	28,706,436	12,250,660	11,230,230	1,751,453	1,677,350	4,402,149	4,146,290	12,908,656	11,652,566
Uncollectible railway revenues	72,886	92,874	33,787	48,608	304	1,142	12,251	13,497	26,544	29,627
Railway operating income	86,301,868	65,418,798	39,502,717	27,920,636	6,402,569	4,507,912	11,040,201	9,078,635	29,356,381	23,911,615
Equipment rents—Dr. balance	7,065,599	6,918,619	4,189,074	3,849,158	d558,629	d447,716	360,245	582,987	3,074,909	2,934,190
Joint facility rent—Dr. balance	1,974,669	1,937,897	997,289	979,195	114,290	142,500	25,383	d53,406	837,707	869,608
Net railway operating income	77,261,600	56,562,282	34,316,354	23,092,283	6,846,908	4,813,128	10,654,573	8,549,054	25,443,765	20,107,817
Ratio of expenses to revenues (per cent) ..	75.84	79.44	76.71	80.95	63.79	69.70	75.95	79.10	76.22	78.90

a Includes \$3,313,652 sleeping and parlor car surcharge.

b Includes \$3,295,206 sleeping and parlor car surcharge.

d Deficit or other reverse items.

Foreign Railways

Perishable Freight By Airplane

The Royal Dutch Air Lines, carrying merchandise between Holland and other continental points on the one hand and Great Britain on the other, carried in 1928, according to a report in the *New York Times*, more than 15,000,000 lb. of fruit, vegetables and flowers; and the total volume of perishable traffic was 70 per cent greater than that carried by these lines in 1927. The Royal Dutch Air Lines are preparing to put into service two new planes, single motored, each with a carrying capacity of about 2,300 lb. It is said that strawberries are delivered in London 12 hours after they are picked in the westland district of Holland. Flowers gathered in the morning in the Dutch gardens are distributed the same day in Britain.

American Railway Engineer Leaves Persia for China

In the fall of 1926, W. P. Poland, an American railway engineer, was invited by the Persian government to come to Persia on a two years contract, as director of railways, to take charge of the location and construction of the proposed National Railway, between the Caspian sea and the Persian gulf. In December Mr. Poland arrived and the surveys were started.

C. J. Carroll, chief engineer of surveys and eight other American engineers, assistants to Mr. Poland, arrived in March, 1927. This staff, assisted by a few Russian and Persian engineers, determined the location between the Caspian sea and the Persian gulf, a distance of 1685 kilometers, and made the preliminary studies for the location of the terminal harbors at Astrabad bay on the Caspian sea and at Khor Musa on the Persian gulf. One hundred and fifty kilometers of the grade were completed.

On the expiration of their two year

contracts, Mr. Poland and the other American engineers withdrew. The completion of the detailed location and the construction has been turned over by the government to a German-American syndicate which includes, for the Germans, the Berger, Holzmann & Siemens Bau Union, and for the American group, the Ulen Company and the J. G. White Company. The syndicate is now going ahead with construction. Mr. Carroll has been retained by the government in its inspection and control bureau.

Shortly after leaving the Persian service, Mr. Poland was appointed by the Chinese government a member of the financial commission under Dr. Kammerer to draw up a new system of finance for the Chinese Empire. Mr. Poland's position will be that of expert on railway finance. The Kammerer Commission sailed from San Francisco for Shanghai, China, on January 18.

New "Blue Train" Express From Calais to Nice

With the inauguration recently of a new "Blue Train" service between Calais and the Mediterranean coast in France, Europe has been introduced to one of its most luxurious and comfortable express services. The trip from Calais to Nice requires about 20 hours of traveling.

Each coach of the new train consists of 10 single-berth compartments, there being no two-berth compartments. However, arrangement is made so that in case two are traveling together, two compartments may be joined by the opening of a large door between them, thus giving the travelers access to a space about ten feet in length in place of the single compartment length. The coaches and compartments are elaborately decorated throughout and the latter are furnished with artistic as well as comfortable fittings.

Traffic

The Chicago, Rock Island & Pacific opened to traffic a 91-mile section (between Amarillo, Tex. and Gruver) of its new line from Amarillo to Liberal, Kan., on March 6.

The twenty-first regular meeting of the Ohio Valley Shippers' Advisory Board will be held at Columbus, Ohio on April, 9. The principal speaker, at a dinner to be given by the Columbus Transportation Club in the evening, will be the Hon. Myers Y. Cooper, governor of Ohio.

New Hampshire Freight Service Not Crippled

Rowland B. Jacobs, president of the New Hampshire Manufacturers' Association, replying to newspaper accounts of

a report which has been issued by the Public Service Commission of the State, says that freight service on the Boston & Maine is better than it has been for many years and is still improving. Reports that manufacturers have experienced difficulty or delay in getting raw materials from outside of the state or in shipping out their finished products, "simply are not so." The manufacturers of New Hampshire, says Mr. Jacobs, are very much concerned as to any unfavorable reaction which might result, in places not familiar with the facts. "If it should get abroad in the land that New Hampshire industries are subject to the difficulties alleged, irreparable injury would be done and the whole State would suffer."

Express Charges To Be Subject To Land-Grant Deductions

Express charges on government shipments handled by the Railway Express Agency, Inc., beginning March 1, 1929, will be subject to land-grant deductions when the transportation is over land-grant railroads and settlement of such charges hereafter will be made on that basis, according to a ruling announced by the Comptroller General, J. R. McCarl, made public by the general accounting office.

The opinion quotes from an opinion given November 21, 1928, to the chairman of the Shipping Board, referring to various previous opinions of the Attorney General which negated making such deductions from payments to express companies on express shipments over land-grant railroads and stated that, as the matter had been brought to the attention of Congress without action on its part, the situation was "one in which the matter is for attention only of the Congress and not elsewhere." However, a new situation is held to have been created by the formation of the Railway Express Agency, Inc., as a joint facility of the railroads controlled by them through stock ownership and the opinion states in part:

"The rulings of the accounting officers many years ago that charges on government express shipments were not subject to land-grant deductions were based primarily upon the theory that the express service was performed by an agency distinct and separate from the railroads, and for that reason, the grant subjecting the railroad to deductions being to the railroad itself, there was no privity in so far as the express agency was concerned to subject it to such deductions, regardless of the fact that under agreements existing between the railroad company and the express company a part of the express charges were a revenue of the railroad. Under the new arrangement there is still a separate agency for express operations but such agency is directly under the control of the railroads, and in the final analysis the new express agency is in fact operating the express business for the benefit of the railroads.

"In the present matter there appears to be no question that the Railway Express Agency, Inc., is merely an instrumentality or adjunct not only of the organized participating railroads, but of each participating railroad subject to land-grant laws, and under the plan of distribution of the earnings the express service is in fact performed by the participating railroad, the express company being merely the agent of the railroad for handling and operating purposes. Under such circumstances, there appears no reason why, in so far as concerns land-grant deductions from express charges, the corporate entity of the express agency should not be disregarded and the matter treated as if the express service actually were performed by the land-grant railroad instead of through the agency of the express company."

Equipment and Supplies

Locomotives

THE CHICAGO & ILLINOIS MIDLAND is inquiring for two 2-8-4 type and two 2-10-2 type locomotives.

THE HAMILTON COKE & IRON COMPANY has ordered one 2-8-0 type locomotive from the Baldwin Locomotive Works.

THE CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA is inquiring for four 2-8-2 type locomotives and five 4-6-2 type locomotives.

THE UNION RAILROAD COMPANY has ordered 12 eight-wheel switching locomotives from the Baldwin Locomotive Works.

THE ILLINOIS TERMINAL RAILROAD SYSTEM has ordered three 2-8-2 type locomotives from the Baldwin Locomotive Works. Inquiry for this equipment was reported in the *Railway Age* of March 9.

THE NEW CORNELIA COPPER COMPANY has ordered four six-wheel switching locomotives from the American Locomotive Company. These locomotives will have 19 by 26 in. cylinders and a total weight in working order of 137,000 lb.

THE CHICAGO & NORTH WESTERN has ordered 25 locomotives of the 4-8-4 type from the Baldwin Locomotive Works. This is in addition to the order for 10 locomotives placed with the same builder and reported in the *Railway Age* of January 12.

THE ERIE has ordered 20 heavy freight locomotives of the 2-8-4 Berkshire type from the Lima Locomotive Works and 15 eight-wheel switching locomotives from the Baldwin Locomotive Works. Inquiry for this equipment was reported in the *Railway Age* of March 2.

This road has also ordered 15 extra locomotive tenders with a capacity of 20,000 gallons of water and twenty-eight tons of coal from the Lima Locomotive Works.

THE ILLINOIS CENTRAL has ordered four electric locomotives from the Westinghouse Electric & Manufacturing Company. These are 100-ton, 1500-volt d.c. switching and transfer locomotives arranged for multiple unit operation and will be placed in service at the Chicago terminal of the Illinois Central in about nine months. They will have four motors of 365 hp. hourly rating and 300 hp. continuous rating; 31,000-lb. tractive effort, one hour, full field; 24,000-lb. tractive effort continuous, full field; speed one hour full field, 17.7 miles an hour; continuous, 18.9 miles an hour; maximum 40 miles an hour. Inquiry for this equipment was reported in the *Railway Age* of November 17.

Freight Cars

THE CHICAGO & NORTH WESTERN is inquiring for from 1,000 to 2,500 box cars of 50 tons' capacity.

THE CHESAPEAKE & OHIO is inquiring for 577 steel hopper bottom gondola car bodies of 70 tons' capacity.

THE AMERICAN BRIDGE COMPANY has ordered 10 flat cars of 50 tons' capacity from the Koppel Industrial Car & Equipment Company.

THE HOCKING VALLEY will build 100 flat cars in its own shops. Inquiry for this equipment was reported in the *Railway Age* of February 2.

THE NATIONAL RAILWAYS OF MEXICO have ordered 1200 box cars of 40 tons' capacity from the Pullman Car & Manufacturing Corporation and 240 narrow gage cars from the Standard Steel Car Company.

Passenger Cars

THE CHICAGO & NORTH WESTERN contemplates buying 24 suburban coaches and four combination suburban cars.

THE ERIE is now inquiring for the 10 express cars and five gas electric cars mentioned in its budget as was reported in the *Railway Age* of March 2.

THE GREAT NORTHERN has ordered from the St. Louis Car Company five gas-electric rail motor cars to be equipped with Electro-Motive Company 400 hp. power plants.

THE TRINITY & BRAZOS VALLEY has ordered from the Pullman Car & Manufacturing Corporation three gas-electric rail motor cars, to be equipped with Electro-Motive Company 400 hp. power plants.

THE NORTHERN PACIFIC has ordered from the St. Louis Car Company seven gas-electric rail motor cars using Electro-Motive Company 300 hp. power plants; two of the cars will be equipped with dual power plants, making a total of 600 hp. each. Inquiry for this equipment was reported in the *Railway Age* of January 26.

Machinery and Tools

THE BOSTON & MAINE has ordered a Neafie tie scoring machine from the American Saw Mill Machinery Company.

THE ATCHISON, TOPEKA & SANTA FE has ordered a Neafie tie scoring machine from the American Saw Mill Machinery Company.

THE CHESAPEAKE & OHIO is inquiring for 21 overhead cranes, one of five, one of 10 and 18 of 15-tons capacity and one 250-ton, five-motor crane.

Signaling

THE NORTHERN PACIFIC has asked bids for the construction of automatic block signals on its line between Tacoma, Wash., and Tenino, 38 miles.

Supply Trade

THE STUEBING COWAN COMPANY, Cincinnati, Ohio, has enlarged its Holyoke, Mass. plant, thereby tripling its capacity.

HENRY W. ARMSTRONG, assistant treasurer of the Joseph Dixon Crucible Company, Jersey City, N. J., has been elected treasurer to succeed the late William Koester.

W. R. WALSH, who has represented the Ewald Iron Company, Louisville, Ky., for the past three years in Chicago, has been appointed resident sales manager, with headquarters as before in the Railway Exchange building.

FRANK C. FARRELL, formerly district manager of the Youngstown Sheet & Tube Company, has been appointed representative of the Steel & Tubes, Inc. division of the Republic Iron & Steel Company.

THE BATES VALVE BAG CORPORATION has been acquired by the St. Regis Paper Company. The business will be carried on as a wholly owned subsidiary of the St. Regis Paper Company, called the Bates Valve Bag Corporation.

THE GENERAL AMERICAN TANK CAR CORPORATION and the General American Car Company will remove their New York offices in the near future from 17 Battery place to the Chanin building, 122 East Forty-second street, New York City.

JACKSON BROWN, JR., 701 Kittridge-building, Denver, Colo., is representing the Roller-Smith Company in Colorado, Utah, Wyoming and Northern New Mexico; the Manila Machinery & Supply Company, Incorporated, Manila, Philippine Islands, represents the company in the Philippine Islands.

THE OHIO BRASS COMPANY, Mansfield, Ohio, has opened a new office at 2143 Railway Exchange building, 611 Olive street, St. Louis, Mo. This office will be the headquarters of H. W. Kilkenny, district sales manager for the company in the St. Louis territory.

SENIOR & PALMER INCORPORATED, has been organized by Frank S. Senior, Edward P. Palmer, and Howard C. Booz, to engage in the business of engineering and contracting with office at 50 Church street, New York City. Mr. Senior has been connected with the Arthur McMullen Company since 1899 and during 15 years of this time served as vice-president. Mr. Palmer has served since 1921 as secretary of the Arthur McMullen Company, and Mr. Booz has been connected with the same company since 1927.

Johns-Manville Corporation

At a meeting of the board of directors of the Johns-Manville Corporation on

March 15, William R. Seigle, vice-president in charge of mines and factories, was elected chairman of the board of directors, and Lewis H. Brown, secretary and assistant to the president, was



William R. Seigle

elected president. Mr. Seigle succeeds H. E. Manville, resigned, and Mr. Brown succeeds Theodore F. Merseles, who died March 6.

William R. Seigle was born at Easton, Pa., in 1879 and has been in the services of Johns-Manville since his graduation from college in 1900, at which time the



Lewis H. Brown

corporation was known as the H. W. Johns Manufacturing Company. His technical training covered the fields of mechanical and electrical engineering, as well as electro-chemistry. His research and development abilities have been responsible for the development of many of the insulating, electrical and building materials upon which the company has based its substantial success. He has a completely equipped private laboratory at his country home at Mamaroneck, N. Y., where he employs regularly a staff of chemists and in which he spends much of his own time. He is an officer and director in numerous other corporations in the United States and abroad.

Lewis H. Brown was born in Creston, Iowa, in 1894 and is a graduate of the University of Iowa, where he studied liberal arts and law. After graduation

he became a salesman and assistant to the sales manager of a manufacturing company in Indiana. He served two years as a captain of infantry in the 84th division and attached as a staff officer at A. E. F. headquarters in France. Immediately after the war he joined Montgomery Ward & Company, serving in various departments of the business, including such positions as those of office manager, superintendent of merchandising, and assistant general operating manager of all plants. Recognizing Mr. Brown as an executive able to handle difficult organization problems, Mr. Merseles selected Mr. Brown to accompany him as his assistant when he became president of Johns-Manville in August, 1927. Mr. Brown is a member of the board of directors of the Fibre Conduit Corporation and many other companies.

Fairbanks, Morse & Co.

The annual report of this company for the year 1928 shows a consolidated net profit for the year, after provision for depreciation, debenture interest, pension fund contributions, and federal income tax, of \$2,161,671, as compared with \$1,641,606 in 1927. Preferred and common stock dividends absorbed \$1,599,154, leaving a balance of undivided profits of \$562,517 which, added to the adjusted surplus at the end of 1927, brings the total surplus and undivided profits of the company and its subsidiaries at the close of the year to \$13,393,935, giving a book value of \$56.81 per share to the 368,977 shares of common stock outstanding. After deducting the preferred stock dividends from the net profit for the year, the balance remaining for the common stock was equal to \$4.52 per share on the 368,977 shares outstanding, compared with \$3.08 per share for 1927.

E. H. Morse, chairman of the board, in his statement to stockholders said in part:

The net billings to customers for the 12 months amounted to \$30,542,420, compared with \$28,391,416 for 1927, an increase for the year of \$2,151,004. The total orders received during the same period aggregated \$31,984,904 compared with \$28,676,975 in 1927. This increase in business was well distributed over the different sales territories, with the exception of the southern states where transactions were below normal, due to local conditions.

The foreign business of the company continues to show satisfactory growth, both in volume and in more extended coverage. Through its own offices, established agents, or special traveling representatives, the company is now represented in practically all parts of the world.

New markets are being systematically developed for the company's products and, in this connection, the company early in the year, organized an additional subsidiary under the name of the Fairbanks-Morse Water Supply Company, whose business is the installation of complete water plants for municipalities, public utilities, and industrial concerns, including the furnishing of their water requirements over a term of years on a definite contract basis where this is desired. Your directors believe that there is a large and profitable field for this class of business, which also opens up a new avenue for the sale of our own pumping and other equipment.

On account of the increase in the sale of large equipment to municipalities and others on extended terms, the company early in the year organized its own finance company under the title of the Municipal Acceptance Corporation, with which it is now discounting its long term receivables. The new corporation has made very favorable banking arrangements, and by its operation your company is conserving for itself the premiums which the established finance companies charge for this service.

The consolidated income and surplus account as of December 31, 1928, follows:

	1928	1927
Operating profit for the year ending December 31, 1928, after deduction of manufacturing, selling and administrative expenses	\$3,819,422	\$3,266,966
Deduct:		
Depreciation of buildings and equipment	857,778	898,749
Interest on debentures..	393,334	342,222
Contributions to the pension fund	154,955	128,183
Federal income tax for the year 1928.....	289,174	256,206
	\$2,124,181	\$1,625,360
Net profit of Municipal Acceptance Corporation for year 1928.....	37,490	
	\$2,161,671	\$1,625,360
Surplus and undivided profits at December 31, 1927, per last report:		
Fairbanks, Morse & Co. \$10,848,416		\$11,853,361
Subsidiary companies..	2,081,473	1,845,612
	\$12,929,889	\$13,698,973
Deduct:		
Premium paid on preferred stock retired...	7,165	14,476
Discount and expense on 15-year 5 per cent debenture issue		457,254
Wisconsin tax settlement pertaining to prior years		173,207
Adjustments pertaining to prior years.....	91,306	155,906
	98,471	800,843
	\$12,831,418	\$12,898,130
	\$14,993,089	\$14,539,738
Dividends for the year:		
On 7 per cent preferred stock	\$492,541	\$503,321
On common stock....	1,106,613	1,106,526
	\$1,599,154	\$1,609,847
Balance, December 31, 1928	\$13,393,935	\$12,929,889

Obituary

Charles T. Pfeiffer, traveling engineer who entered the service of the American Arch Company in 1910, died at his home in Milwaukee, Wis., on March 18.

Edwin H. Cook, who covered the southern territory for the American Arch Company, died suddenly at Mobile, Ala., on March 13. Mr. Cook went with the American Arch Company in 1913; his home was at Atlanta, Ga.

Trade Publications

RIVER BANK EROSION.—In a bulletin of 12 pages issued by Woods Brothers Construction Company, Lincoln, Neb., are presented illustrations and descriptive matter of the several forms of current retards, which that company has been installing for a number of years, to stop the erosion of river banks. Photographs taken before and after installation clearly show the effect produced by the retards.

MOVABLE BRIDGE ACCESSORIES.—The Norwood-Noonan Company of Chicago has issued a number of revised bulletins and additions to its catalogue on accessories for movable bridges. These cover roadway warning signals, gas engines, units for the operation of movable bridge spans and various forms of bridge lamps designed to meet the requirements of the War department for the protection of navigation, two being color plates.

Construction

ATCHISON, TOPEKA & SANTA FE.—A contract has been awarded for the construction of an extension of the Cane Belt from Lane City, Tex., to Guy, 18 miles, into the sulphur fields in that vicinity, to the Lone Star Construction Company, San Antonio, Tex. While the certificate authorized by the Interstate Commerce Commission provided for the construction of 17 additional miles from Guy to Thompsons, an agreement has been effected with the Southern Pacific for the use of that company's line between Guy and the Gulf, Colorado & Santa Fe at Rosenberg, Tex. The contract covers grading and bridging and it is intended to lay track with company forces.

CANADIAN NATIONAL.—This road is contemplating an expenditure of about \$1,000,000 for the construction of new yards and terminal buildings including shops at Tecumseh, Ont. It also proposes to build an industrial spur about four miles long with sidings on its line at Walkerville, Ont., at an estimated cost of \$500,000. The latter project will be carried out by company forces.

CANADIAN PACIFIC.—The general contract for the construction of a 270-room addition to the Empress hotel, Victoria, B. C., has been let to the Carter-Halls-Aldinger Company, Winnipeg, Man. The contract for the steel work has been awarded to the Dominion Bridge Company, Winnipeg. A contract for the construction of a four-story addition to the Palliser hotel, Calgary, Alta., has been also let to the Carter-Halls-Aldinger Company.

CHESAPEAKE & OHIO.—This company has awarded a number of contracts for construction work as follows: To J. T. Nuckols, Richmond, Va., for the building of a new freight house at Covington, Ky., to cost about \$97,500; to L. W. Hancock, Louisville, Ky., for work in connection with engine terminal improvements at Stevens, Ky.; to Board & Board, Charleston, W. Va., for grading and masonry work in preparation for the laying of a third track between Barboursville and Guyondot, W. Va., the entire project to cost about \$801,813; to Hunt Forbes Construction Company, Huntington, W. Va., for grading and masonry work for a new third track between Huntington and Kenova, W. Va.; and to J. H. Montague Richmond, Va., for grading work for track changes in connection with engine terminal improvements at Fulton, near Richmond, Va.

CHICAGO & NORTH WESTERN.—A contract has been let to Henry Danischewsky, Milwaukee, Wis., for the construction of a dock warehouse on the Menominee canal in the harbor at Milwaukee. The warehouse will consist of two wings, which will have outside dimensions respectively of 400 ft. by 75 ft. and 500

ft. by 70 ft. A contract for the construction of 400 lin. ft. of reinforced concrete dock and 500 lin. ft. of timber dock in connection with the warehouse has been let to the Edward R. Gillen Company, Milwaukee. The cost of the entire project is estimated at \$250,000.

ERIE.—This company has included in its budget for 1929 the expenditure of \$55,000 for the construction of an addition to the classification yard at Marion, Ohio. At the same point it is planned to rearrange the eastbound manifest yard and to install flood lights at the westbound hump and at the eastbound yard. About \$20,000 has been provided the construction of pipe lines in connection with a new water treating plant. The extension of two passing tracks near Lima, Ohio, to accommodate trains of from 140 to 160 cars will involve the expenditure of about \$50,000.

GRAND TRUNK SYSTEM.—A contract for the construction of the substructure for a bascule bridge over the Black river at Port Huron, Mich., has been let to the R. C. Huffman Construction Company, Cleveland, Ohio. The steel superstructure, contract for which has not yet been awarded, will be installed and erected by the manufacturer of the steel. This company plans to let within the near future a contract for the grading of the uncompleted section of the proposed belt line around Pontiac, Mich., which will form a connection between the Detroit, Grand Haven & Milwaukee and the Oxford & Northern.

KANSAS CITY, MEXICO & ORIENT OF TEXAS.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of a line from San Angelo to Sonora, Tex., 65 miles, to be operated under lease by the Panhandle & Santa Fe. Funds for

the construction are to be advanced by the Atchison, Topeka & Santa Fe.

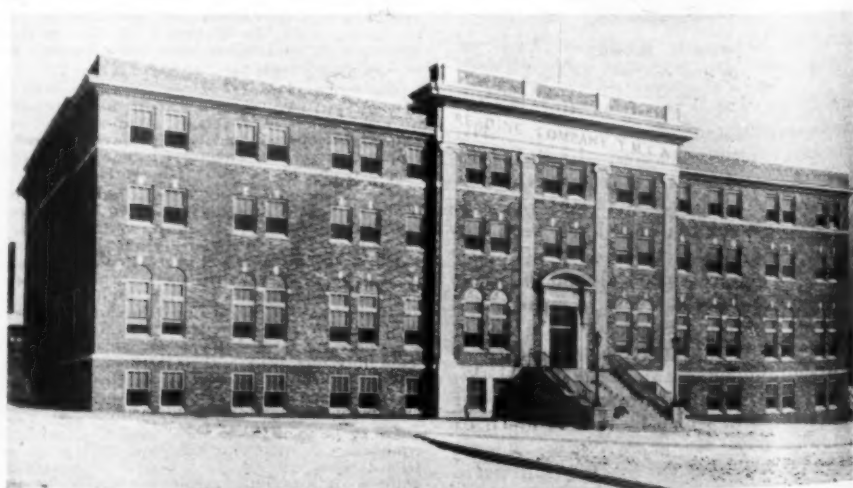
MOBILE & OHIO.—A contract for the construction of an 18-stall roundhouse, a boiler house, a storehouse and an employees' locker building at East St. Louis, Ill., has been let to the Ellington-Miller Company, Chicago. All buildings will be constructed of brick and the expenditure for this project will be about \$180,000.

NORTHERN PACIFIC.—This company expects to ask for bids on April 1, for the construction of a steel car repair shop at Laurel, Mont. The cost of the portion of the work to be let under this contract will be about \$40,000.

ST. LOUIS-SAN FRANCISCO.—A contract for the construction of second main track between Clarksdale, Ark., and Harvard, 5 miles, has been let to Reid & Lowe, Birmingham, Ala., at a cost of about \$317,000. This contract includes the grading, bridging, track laying and ballasting. A contract has been awarded to the Holmboe Construction Company, Oklahoma City, Okla., for the construction of a freight station at Oklahoma City which, with accompanying facilities, will involve an expenditure of \$344,000. A contract for the construction of concrete engine pits and foundations for a 12-stall extension to the roundhouse at Lindenwood (St. Louis), Mo., has been let to the J. W. McMurry Contracting Company, Kansas City, Mo. This addition will require the expenditure of \$260,000.

SANTA FE, SAN JUAN & NORTHERN.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of an extension from Tilden to Cuba, N. M., 11.32 miles, the operation of a line from San Ysidro to Tilden, N. M., which it has acquired from the Santa Fe Northern, and the operation under trackage rights over a line of the Santa Fe Northwestern from San Ysidro to Bernalillo, N. M., 23.9 miles. Sidney M. Weil, Albuquerque, N. M., is vice-president of the company.

* * *



Building Presented to Employees by Reading Company

New Building of the Railroad Young Men's Christian Association Recently Dedicated at Reading, Pa.

Railway Finance

ATCHISON, TOPEKA & SANTA FE.—Lease of K. C. M. & O.—This company has applied to the Interstate Commerce Commission for authority to acquire control by lease of the property of the Kansas City, Mexico & Orient, having been previously authorized to acquire control of the company by stock purchase. The Panhandle & Santa Fe has also applied for authority to lease the property of the Kansas City, Mexico & Orient of Texas, including a proposed extension from San Angelo to Sonora, Tex., 65 miles, and also to operate for the account of the Atchison the line of the K. C. M. & O. from the Texas-Oklahoma state line to Altus, Okla., 13 miles.

BIG CREEK & TOLOCASET.—Stock.—The Interstate Commerce Commission has authorized this company to issue \$109,646 of \$100 par capital stock to be delivered to the Grande Ronde Lumber Company in payment for its line of railroad in the state of Oregon.

BUFFALO, ROCHESTER & PITTSBURGH.—Acquisition.—This company has applied to the Interstate Commerce Commission for authority to acquire control by lease of the Reynoldsville & Falls Creek, 13 miles.

CANADIAN NATIONAL.—Acquisition of Quebec, Montreal & Southern.—The Canadian House of Commons Railway committee has approved the purchase of the Q. M. & N. by the C. N. R. from the Delaware & Hudson at a price of \$6,000,000. Regarding this property President Sir Henry Thornton had the following to say:

The Quebec, Montreal & Southern extends from a junction with the Canadian National at St. Lambert, opposite Montreal, easterly along the south shore of the St. Lawrence river through Sorel and Yamaska to Fortierville, a distance of 110 miles, with a branch extending in a southerly direction from Bellevue Junction, which is 5 miles southeast of Sorel, to a connection with the Canadian National at Noyan, a distance of 81 miles, passing through St. Hyacinthe and Iberville.

The cost of reproduction, less depreciation, of the railway, exclusive of equipment is \$4,200,000. The equipment cost of reproduction, less depreciation, is \$1,900,000.

Through the purchase of this line, the Canadian National will be able to effect economies in the operation of lines on the Levis division to the extent of \$150,000 per year, and expects to make use of this low gradient line for heavy freight service between Montreal and Quebec. The Levis division is the third heaviest traffic division on the system, and consideration has been given for some time to the possibility of effecting grade revisions, so as to reduce the grades on the present line between Montreal and Quebec, which are 1 per cent, and the Quebec, Montreal & Southern from Montreal to Fortierville will make it possible to obtain a 0.4 per cent gradient between Montreal and Quebec through the construction of a 20-mile connection with the existing line from Fortierville.

CHESAPEAKE & OHIO.—Bonds.—The Interstate Commerce Commission has issued a modification, requested by the company, of its recent order authorizing an issue of \$24,784,000 of refunding and improvement mortgage bonds, so that the company may use \$8,073,023 of the proceeds in the payment of promissory notes

to the Secretary of the Treasury instead of using that amount for additions and betterments.

CHICAGO, INDIANAPOLIS & LOUISVILLE.—Objects to Inclusion in B. & O. System.—This company has filed with the Interstate Commerce Commission a petition asking leave to file objections to the commission's tentative plan of consolidation, promulgated in 1921, in so far as it includes the Monon as part of a Baltimore & Ohio system in System No. 3 of the tentative plan. The petition refers to the joint control of the Monon by the Southern and Louisville & Nashville and states that the public interest will be best promoted by including its property in those systems in any plan for the consolidation of the railways which the commission may finally adopt. The Southern and L. & N., recently filed with the commission an objection to the proposal in an application filed by the Baltimore & Ohio that the Monon be included in its system.

CHICAGO, ROCK ISLAND & PACIFIC.—Abandonment.—The Interstate Commerce Commission has authorized this company to abandon its line from Wallace, Mo., to Edgerton Junction, 12.9 miles. The railroad had applied for authority to abandon the entire Rushville branch between Edgerton Junction and Rushville, 25 miles, but the application was denied for that portion of the line between Wallace and Rushville.

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC.—Abandonment.—This company has applied to the Interstate Commerce Commission for authority to abandon part of a branch line from Springfield to Running water, S. D., 6.71 miles. Authority also has been asked to abandon a branch line from Babcock to Norway, Wis., 15 miles.

CHICAGO & NORTH WESTERN.—Abandonment.—The Interstate Commerce Commission has authorized this company to abandon its Lindquist line in Oconto and Langlade Counties, Wis., 15.5 miles.

CHICAGO, SPRINGFIELD & ST. LOUIS.—Acquisition and operation of Jacksonville & Havana.—The Interstate Commerce Commission has authorized this company to take over and operate the Jacksonville & Havana, 41.2 miles, in Morgan, Cass and Mason Counties, Ill., and to operate under trackage rights over the Chicago, Burlington & Quincy between Waverly and Jacksonville, 18 miles. The C. S. & St. L. and the J. & H., under common ownership, operate separate segments of the former Chicago, Peoria & St. Louis, trackage rights over the Burlington connecting these isolated segments. The Commission has authorized the C. S. & St. L., to issue \$750,000 of prior lien mortgage 20-year 6 per cent bonds, \$1,500,000 of first equipment and refunding mortgage 6 per cent bonds, Series A,

27,500 shares of common stock of \$5 par value and \$16,500 of preferred stock of \$100 par value; to pledge \$376,000 of prior lien mortgage 20-year 6 per cent bonds; and to assume obligation and liability in respect to \$18,894 of lease warrants of the Jacksonville & Havana. Of the \$750,000 of prior lien bonds, \$500,000 are to be issued in lieu of like amount of such bonds issued without authorization. The remaining \$250,000 will be sold upon competitive bidding at not less than 90. The equipment and refunding mortgage bonds are to be sold under competitive bidding at not less than 82.5.

DELAWARE & HUDSON.—Hearing on Reorganization.—The Interstate Commerce Commission has assigned for hearing at Washington on April 4 the joint application filed by the Delaware & Hudson Company and the Delaware & Hudson Railroad Corporation for authority for the former to abandon its railroad property and for the latter to acquire and operate it.

FORT WORTH & DENVER CITY.—Lease of Extension.—The Interstate Commerce Commission has authorized this company to acquire control by lease of the 1.4-mile extension in Lockney, Tex., constructed by the Fort Worth & Denver South Plains.

GULF, MOBILE & NORTHERN.—Purchase of Subsidiaries.—The stockholders of this company, at a meeting in Mobile, Ala., approved the purchase of the Meridian & Memphis, extending from Meridian, Miss., to Union, 32 miles, and the Birmingham & Northwestern, extending from Jackson, Tenn., to Dyersburg, 49 miles. Both railroads have been operated by the G., M. & N. under lease.

KANSAS CITY, MERIAM & SHAWNEE.—Authority to Operate in Interstate Commerce.—The Interstate Commerce Commission has authorized this electric interurban line to operate in interstate commerce and to construct a connection with the lines of the St. Louis-San Francisco to provide for the interchange of freight traffic.

KANSAS CITY SOUTHERN.—I. C. C. Asked to Investigate.—The Waco, Beaumont, Trinity & Sabine has filed with the Interstate Commerce Commission a petition asking it to require the Kansas City Southern and the Missouri-Kansas-Texas to furnish it with complete information as to who controls the two companies, alleging that interests which dominate the K. C. S. still exert control and influence over the affairs of the M-K-T although the K. C. S. has disposed of its stock in the latter. It is asserted on information and belief that Kuhn, Loeb & Co., hold a substantial amount of stock of the M-K-T and exert the power and authority thereof in the interest of the K. C. S.

LOUISIANA RAILWAY & NAVIGATION COMPANY.—Securities.—The Interstate Commerce Commission has authorized this company to substitute the National

(Continued on page 690)

Annual Report

Thirty-Fifth Annual Report of the Southern Railway Company Year Ended December 31, 1928

RICHMOND, VA., March 13, 1929.

To the Stockholders of

SOUTHERN RAILWAY COMPANY:

The Board of Directors submits the following report of the affairs of the Company for the year ended December 31, 1928:

The Year's Business

Income and Dividends.

The balance of income after the payment of fixed charges and the preferred stock dividend was equivalent to \$12.53 per share on the common stock compared with \$14.40 per share in the preceding year. Dividends of 5% on the preferred stock and 8% on the common stock were paid in quarterly installments, these being the same rates as were paid in the preceding year. The balance of income after payment of these dividends was \$5,881,533, which was invested in additions and improvements to the plant.

Freight Traffic.

The volume of freight traffic was maintained near the level established the year before. A downward trend during the earlier months of 1928 was succeeded by an upturn commencing in October sufficient to round out the year with a decrease of only six-tenths of one per cent in freight revenue. The statistics:

	1928	1927
Freight moved.....	45,807,934 tons	46,158,865 tons
Average distance moved...	183.65 miles	183.77 miles
Ton miles	8,412,608,256	8,482,575,749
Average revenue per ton mile	1.291c	1.289c
Total freight revenue.....	\$108,640,634	\$109,331,009

Passenger Traffic.

The progressive recession of passenger business continued.

	1928	1927
Number of passengers	7,051,100	8,093,490
Average journey	101.33 miles	97.47 miles
Passenger miles	714,476,824	788,884,193
Average revenue per passenger mile	3.361c	3.391c
Total passenger revenue ...	\$24,016,843	\$26,749,397

Passenger traffic has been declining for five years, during which period that item of revenue has fallen thirty per cent. A constructive solution of this problem has not been found, although a number of experiments are being made, e. g. low excursion fares, attractively equipped coaches, the experimental substitution of highway bus operation for unprofitable trains, and the co-ordination of rail and bus service. The control of the expense side has been more effective through reduction of passenger train mileage and organization personnel. But it must be noted that the loss is not altogether net. While the automobile has taken from us a substantial part of our passenger revenue, it has at the same time made a large contribution to our freight revenue, no less than 15% of which last year was derived from the transportation of automobiles and parts, oil and gasoline, road building materials and other commodities which moved by rail to supply demands created by the widespread use of the automobile.

Miscellaneous Traffic.

Mail, express and miscellaneous operating revenue items

totaled \$11,458,975, a decline of \$99,681 from the year before.

Total Operating Revenue.

The total revenue derived from the operation of the railroad was \$144,116,452, or \$3,522,610 less than in 1927.

Operating Expenses.

To meet this decrease in revenue there was accomplished a reduction of \$2,020,235 in operating expenses; but this figure does not tell the whole story of the effort and plans for economy. The expense account might have been further curtailed had it not been for extraordinary expenditures to repair flood damage following destructive storms during the past summer. In the maintenance of way account alone this cost was \$740,000, in addition to which the interruption of the regular flow of traffic, as well as the emergency handling of materials used in the work of rehabilitation, added to transportation expenses a substantial burden which cannot be accurately stated in figures.

In the following table are set forth the expenditures out of each dollar of gross revenue for the several general heads of operating expenses in 1928 in comparison with 1927:

	1928	1927
Transportation of the traffic	33.01c	33.42c
Maintaining roadbed and structures	14.61c	13.77c
Maintaining rolling stock	17.26c	17.67c
Traffic solicitation and supervision	2.16c	2.06c
General expenses	3.01c	2.83c
Operating dining cars and other incidental services65c	.63c

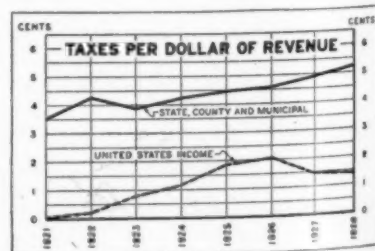
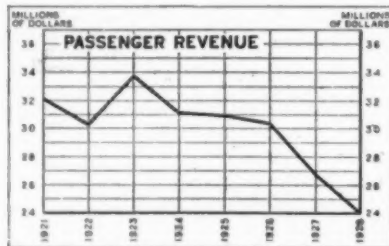
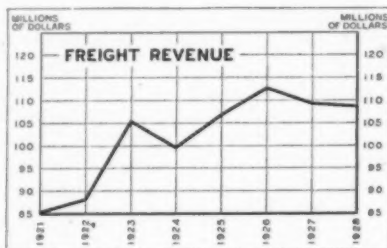
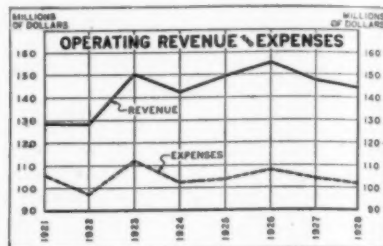
Totals	70.70c	70.38c
of which wages required	58.90%	58.41%

The following comparison of transportation expense units over a five-year period affords evidence of progress in the direction of economical operation of an improved plant:

	1928 compared with 1924	Increase	Decrease
Gross ton miles per freight train hour ...	21.02%		
Number of cars per freight train	14.74%		
Freight train load	8.96%		
Daily freight car mileage	6.77%		
Total freight train transportation expense per thousand gross ton miles		21.06%	
Loss and damage freight claims per thousand ton miles		28.13%	
Overtime wage payments in train and engine service		22.66%	
Wage cost of freight train crews per thousand gross ton miles		9.61%	
Coal consumed by freight engines per thousand gross ton miles		11.73%	
Coal consumed by passenger engines per passenger car mile		5.38%	

Taxes.

The progressive increase in taxes (principally property taxes) assessed by states, counties and municipalities showed no abatement, the figure for 1928 being \$7,568,437, the highest in the Company's history. The income tax paid to the United States Government was lower by reason of a smaller taxable income and, what was welcome, a reduc-



tion in the tax rate. The contrast in the trend of the two items on the chart is conspicuous. The total of all taxes, viz: \$9,579,113, required 6.65 cents of each dollar of gross revenue compared with 6.40 cents in the preceding year.

Interest and Rental Charges.

The disbursement for interest on mortgage bonds and equipment trust obligations and rentals for leased railroads, viz: \$17,659,714, was approximately the same as in 1927, when it was \$17,528,732. It is of interest to note in this connection that an increase of \$86,089,019 in capital investment during the past five years has been accompanied by an expansion in capital liabilities of only \$23,171,000, the latter figure including the issue of \$9,820,000 of additional common stock.

Income from Investments.

Income from sources other than operation, including interest and dividends on corporate and Government securities owned and interest on bank balances, was \$6,382,900 compared with \$6,823,150 in 1927.

Additions to the Property

Important items of the 1928 improvement program were the addition to rolling stock equipment of 43 new locomotives, 5,450 new freight train cars and 25 new passenger train cars contracted for through Equipment Trust Agreement Series "BB", which were received from the builders and placed in service during the year; new engine terminal facilities at Macon, Ga.; the enlargement of freight depots at Winston-Salem, High Point and Gastonia, N. C.; additional yard track facilities at Greensboro, N. C.; the strengthening of structures and the lengthening of passing tracks on the line between Louisville and Danville, Ky., to permit the use of heavier power; the elimination of thirty-three highway grade crossings by the construction of viaducts and underpasses; the laying of 200 miles of new 100-lb. rail and 58 miles of new 130-lb. rail in replacement of rail of lighter sections in the main lines; the erection of three telephone circuits between Washington and Atlanta, and the construction of a large addition to the office building in Atlanta.

Industrial and Agricultural Development

Considered in the aggregate, industry and commerce in the South marked time in 1928. Some activities continued to expand while others conspicuously slowed down; the net weighted average indicating a relatively small loss of purchasing power, the measure of which is fairly reflected by the recession of freight revenues. Nevertheless, the factory capacity of the territory served by Southern Railway System was increased by the establishment of 172 new industrial plants, and the enlargement of 91 others, representing an investment of more than \$125,000,000.

The year witnessed further expansion of the rayon industry through the location in the South of two new plants for the manufacture of that product and an addition to another plant previously established. Construction work was started on a mill for rolling aluminum alloy into sheets and plates. A start has been made toward the manufacture of automobile tires in the South with the selection of a site for that purpose at Gadsden, Ala. With the increasing use of automobiles, facilities for the storage and distribution of gasoline have been expanded throughout the territory, and highway improvement work has continued on a substantial scale in all of the Southern states.

While the operations of the cotton textile industry have not been uniformly profitable in the recent past, in consequence of what has been regarded as a temporary over-expansion during a period of increasing use of other fabrics in wearing apparel at the expense of the demand for cotton goods, the mills of the South have suffered relatively less in this respect than have those in other parts of the United States. During the past six years the number of cotton spindles in the South has been increased 2,443,327, or 15%, while the number of spindles in mills outside of the South has been reduced 4,364,632, or 21%.

The year 1928 was a conspicuously difficult one for the farmer in the South. The production of several crops, including corn, oats and sweet potatoes, fell substantially below the preceding year as a result of adverse weather conditions. The quality of peaches, watermelons and tobacco was affected by the excessive rainfall and prices suffered in consequence. The actually large crops of apples and Irish potatoes brought relatively lower prices. Cotton production in our territory was approximately the same as the year before. The estimated value placed by the United States Department of Agriculture on all crops produced in 1928 in the states lying south of the Ohio and Potomac rivers and east of the Mississippi is \$1,901,987,000, a decrease of \$106,482,000, or 5.30%, from the like estimate of the crops of 1927. As in other years, the more profitable agricultural activities were those which did not depend upon a single crop and which included live stock raising and dairying. A good illustration of the growth of milk pro-

Financial Results for the Year

	1928	1927
The Company received from freight, passenger and other miscellaneous operations a total revenue of	\$144,116,452	\$147,639,062
The cost of maintaining the property and of operating the railroad was.....	101,887,718	103,907,953
Leaving a balance from railroad operations of..	\$42,228,734	\$43,731,109
Federal, state and local taxes, (plus a small amount of uncollectible items) required....	9,598,380	9,488,877
Leaving a balance of.....	\$32,630,354	\$34,242,232
The Company paid to other companies for hire of equipment and use of joint facilities in excess of the amount received by it from those sources	1,787,799	1,477,170
This leaves an income from railway operations of	\$30,842,555	\$32,765,062
Other income derived from investments in stocks and bonds of affiliated companies and miscellaneous items was	6,382,900	6,823,150
Making a total income of.....	\$37,225,455	\$39,588,212
Interest on funded debt and equipment trust obligations, rents paid for leased railroads, and other miscellaneous deductions totaled..	17,958,322	17,888,304
There then remained a balance available for dividends, working capital and other corporate purposes of	\$19,267,133	\$21,699,908
The regular dividends on the 5% Preferred stock were	3,000,000	3,000,000
This left a balance of.....	\$16,267,133	\$18,699,908
The earnings per share of common stock were equivalent to	\$12.53	\$14.40
The dividend per share paid on the common stock was	\$8.00	\$8.00

Financial Position at the End of the Year

	December 31, 1928	December 31, 1927	Increase or Decrease
The Company has investments in land, railroad tracks, terminal facilities, shops, locomotives, freight and passenger cars and other fixed property of	\$549,047,286	\$531,471,776	\$17,575,510
Cash derived from subscriptions to additional common stock set aside as a construction fund	1,662,030	2,804,804	(d) 1,142,774
In addition the Company had investments in stocks, bonds and notes of affiliated companies carried at	68,627,392	68,644,318	(d) 16,926
Total Investments	\$619,336,708	\$602,920,898	\$16,415,810
Cash working capital.....	\$18,257,797	\$19,236,520	(d) \$978,723
Cash reserve invested in U. S. Government securities	25,215,981	25,216,310	(d) 329
Other railroad companies and others owed the Company..	8,020,131	7,638,959	381,172
The Company had on hand fuel, rails, ties, bridge material and other supplies necessary for keeping road equipment in good repair...	8,251,533	10,768,775	(d) 2,517,242
Insurance Fund Reserve, other deferred assets and unadjusted debits, including items owed but not yet available to the Company.....	7,302,241	6,537,232	765,009
The Assets of the Company totaled	\$686,384,391	\$672,318,694	\$14,065,697
The Company owed for materials, supplies, wages and balances to other railroad companies, and interest and rents accrued but not yet due	\$21,370,679	\$21,722,962	(d) \$352,283
Taxes accrued but not due....	3,474,240	4,160,334	(d) 686,094
Operating and insurance reserves	3,977,965	4,061,791	(d) 83,826
Reserve for depreciation of equipment	34,543,117	31,788,429	2,754,688
Reserve for dividends on preferred and common stocks..	5,596,400	5,596,400
Deferred liabilities, including items due to others not yet adjusted	7,866,091	7,920,865	(d) 54,774
The total of these liabilities, credits and reserves was....	\$76,828,492	\$75,250,781	\$1,577,711
After deducting these items from the total assets there remained available for the capitalization of the Company net assets of	\$609,555,899	\$597,067,913	\$12,487,986
The capitalization of the Company consisted of the following:			
Funded Debt, including bonds and equipment trust obligations	\$304,691,018	\$298,304,935	\$6,386,083
Preferred Stock, par value..	60,000,000	60,000,000
Common Stock, par value...	129,820,000	129,818,560	1,440
Making a total capitalization of.....	\$494,511,018	\$488,123,495	\$6,387,523
After deducting this capitalization from net assets there remained a surplus of.....	\$115,044,881	\$108,944,418	\$6,100,463
(This surplus has, in large measure, been reinvested in the property.)			

duction in the South, and its financial importance to an agricultural community, is afforded by the record of a milk condensing plant which began operations in Tennessee early in 1928. In nine months this plant had paid to the farmers of the surrounding country for milk more than \$300,000, and a survey revealed the fact that these farmers had procured this added income without curtailing their productive activities in other directions.

Southern agriculture and industry are in sound condition despite some handicaps of a temporary nature, and the confidence of experienced observers in the South's economic future is unabated. Another step forward is expected in 1930.

The Investment Status of Southern Stock

There has been a steady flow of Southern stock from the market place to the strong boxes of investors. During the past five years the total number of shares registered in the names of stock brokerage firms has decreased more than 50%, there being now only 372,000 shares in "Street" names out of a total issue of 1,898,200 shares. Last year the names of 3,034

individuals were added to the stock list, the average holding of these new stockholders being forty shares. It is significant, and to the management particularly gratifying, that a substantial part of this increase was in residents of the states served by Southern Railway System lines, a community which has only begun to invest in industry of a national scope during the past decade.

The attention of the stockholders again is invited to the two statements setting forth simply and untechnically the important statistics concerning the year's business and the Company's financial condition.

To all officers and employees who have faithfully and efficiently performed their duties during the past year the thanks of the Board of Directors again are tendered.

Respectfully submitted, by order of the Board,
FAIRFAX HARRISON,
President.

[ADVERTISEMENT]

Financial

(Continued from page 687)

Park Bank of New York as trustee instead of the Farmers Loan & Trust Company in respect to its issue of \$750,000 of first mortgage six per cent bonds.

MERIDIAN & MEMPHIS.—*Transfer of property rights.*—At a meeting held at Meridian, Miss., the stockholders approved the transfer of all property rights of this company to the Gulf, Mobile & Northern, by which it has been operated under lease.

MICHIGAN CENTRAL.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue \$7,634,600 of refunding and improvement mortgage 4½ per cent bonds, for the retirement and refunding of a like amount of 20-year 4 per cent gold debentures of 1909, due April 1.

MIDLAND VALLEY.—*Acquisition of Line.*—The Interstate Commerce Commission has authorized this company to acquire the Wichita & Midland Valley, a 50-mile subsidiary extending northwest from Arkansas City, Kan., to Wichita, all the stock and bonds of which it owns.

MISSOURI PACIFIC.—*Bonds.*—This company is planning, subject to the approval of the Interstate Commerce Commission, to issue \$46,392,000 of 20-year, 5½ per cent, convertible bonds, Series A. They may be converted into common stock at par any time after May 1, 1931, and the entire issue may be called for redemption between 1934 and 1944 at 105. The bonds are to be offered to the preferred and common share holders as of April 1, 1929, to the extent of 30 per cent of their holdings, at 97.5, to yield 5.71 per cent interest. Approximately \$30,000,000 of the issue will be devoted to redeeming, on July 1, the maturing unifying and refunding 4 per cent bonds of the St. Louis, Iron Mountain & Southern. The issue has been underwritten by Kuhn, Loeb & Co.

NEW YORK, CHICAGO & ST. LOUIS.—*Acquisition.*—This company has applied to the Interstate Commerce Commission

for authority for the acquisition of part and the operation of all of the railroad tracks of the Elwood, Anderson & Lapelle, formerly owned by the American Sheet & Tin Plate Company, which has about 5 miles of track at Elwood City, Ind.

NORTHERN ALBERTA.—*Control by C. P. R. and C. N. R.*—With little debate the House Committee on Railways and Telegraph Lines at Ottawa last week approved the bill enabling the Canadian National to enter into the deal with the Canadian Pacific for joint purchase for the sum of \$25,000,000 of the three railways now owned by the Alberta government and including the Edmonton, Dunvegan & British Columbia and the Alberta Great Waterways line. The company incorporated to make the purchase and jointly operate these roads for the two purchasers is to be known as the Northern Alberta Railway Company.

PITTSBURGH & WEST VIRGINIA.—*Bonds.*—This company has filed with the Interstate Commerce Commission asking authority to issue and sell \$3,000,000 of first mortgage 30-year 4½ per cent bonds, the proceeds to be used in the construction of the Connellsville extension, in addition to the \$3,000,000 of similar bonds previously authorized by the commission. The application states that it has accepted an offer of 93½ for the bonds from Brown Brothers & Co., subject to approval by the Commission.

SOUTHERN PACIFIC.—*Abandonment.*—The Interstate Commerce Commission has authorized this company, lessee, and the El Paso & Southwestern, lessor, to abandon a 31-mile line of the latter company between Deming, N. M., and Hermanas.

SOUTHERN PACIFIC.—*Acquisition.*—The Interstate Commerce Commission has authorized this company to acquire and operate a 4.4 mile line extending from one of its branch lines at North Branch, Cal., to Kentucky House. This line has heretofore been operated by a cement company.

UNION TERMINAL.—*Notes.*—The Interstate Commerce Commission has author-

ized this company, located at St. Joseph, Mo., to issue \$650,000 of first mortgage 5 per cent 20-year notes, said notes to be sold to the Missouri Pacific at par for cash and a portion of the proceeds to be used for purchasing a grain elevator and the remainder for improving this property.

Dividends Declared

Boston & Maine.—Old 6 per cent Preferred, 1½ per cent; Prior Preferred, 1¼ per cent, quarterly; First Preferred, Class A, 1¼ per cent, quarterly; First Preferred, Class B, 2 per cent, quarterly; First Preferred, Class C, 1¼ per cent, quarterly; First Preferred, Class D, 2½ per cent, quarterly; First Preferred, Class E, 1½ per cent, quarterly, all payable April 1 to holders of record March 15.

Joliet & Chicago.—1¼ per cent, quarterly, payable April 1 to holders of record March 22 to April 1.

Kansas City Southern.—Preferred, 1 per cent, quarterly, payable April 15 to holders of record March 30.

Michigan Central.—100 per cent, payable March 28 to holders of record March 23.

New York Central.—2 per cent, quarterly, payable May 1 to holders of record March 28.

Pittsburgh, Bessemer & Lake Erie.—Common, \$75, payable April 1 to holders of record March 15.

Pittsburgh & West Virginia.—Common, 1½ per cent, quarterly, payable April 30 to holders of record April 15.

Average Prices of Stocks and of Bonds

	Mar. 19	Last week	Last year
Average price of 20 representative railway stocks.	132.95	132.33	120.61
Average price of 20 representative railway bonds.	90.43	90.76	97.22

* * *



On the Pennsylvania

Railway Officers

Executive

Katherine Wilson, assistant to the vice-president of the Steam lines of the Illinois Terminal System, with headquarters at Alton, Ill., has resigned after 30 years of service with that company.

J. Edward Davey has resigned as vice-president, assistant secretary and assistant treasurer of the International-Great Northern, with headquarters at New York, to become connected with the executive department of the Columbia Gas & Electric Corporation at New York.

H. Wheeler, president and general manager of the White Pass & Yukon Route, and **C. J. Rogers**, purchasing agent, both with headquarters at Seattle, Wash., have been temporarily engaged in a consulting capacity by Close Brothers & Co., London, England, in the planning of the construction of a system of rail lines in Bermuda.

Financial, Legal and Accounting

William T. Faricy, general attorney of the Chicago, St. Paul, Minneapolis & Omaha, with headquarters at St. Paul, Minn., has been promoted to general solicitor, with headquarters at the same point, succeeding **Richard L. Kennedy**, who retired from active duty on March 1, because of ill health. Mr. Kennedy was born on March 8, 1872, at Pittsburgh, Pa., and graduated from Cutler Academy in 1891 and from Princeton University in 1895. Three years later he graduated from the Harvard Law School, entering railway service in April, 1908, as an attorney for the Omaha. In 1910 Mr. Kennedy was promoted to general attorney, with headquarters at St. Paul. During federal control of the railroads, from January 1, 1918, to March 1, 1920, he served as general solicitor of the Omaha, the Minneapolis Eastern, the St. Paul Union Depot, the St. Paul Bridge and Terminal and the Minnesota Transfer. At the termination of federal control he was appointed general solicitor of the Omaha, a position he held continuously until his retirement.

William H. Curle, general solicitor of the Canadian Pacific, with headquarters at Montreal, Que., has been appointed general counsel, with the same headquarters. **Edward P. Flintoft**, assistant general solicitor at Montreal, will succeed Mr. Curle as general solicitor. Mr. Curle was born in Illinois in 1870. He was graduated from Queen's University, Kingston, Ont., in 1889 and from Osgoode Hall in 1895. He entered the

service of the Canadian Pacific in 1908 as solicitor, remaining in that position until 1917, at which time he was appointed general solicitor. Mr. Curle served in the latter position continuously until his recent promotion to the position of general counsel. Mr. Flintoft



William H. Curle

was born at Sarnia, Ont., in October, 1879, and was graduated from the University of Toronto and from Law School at Toronto. He entered the service of the Canadian Pacific in November, 1908, as assistant to the solicitor. He remained in that position



Edward P. Flintoft

until January, 1912, at which time he was promoted to assistant solicitor. In August, 1914, Mr. Flintoft was appointed solicitor and in March, 1917, he was promoted to the position of assistant general solicitor at Montreal, in which capacity he served until his recent appointment as general solicitor.

Operating

J. Gilardi has been appointed superintendent of the Beaver, Meade & Englewood, with headquarters at Forgan, Okla.

W. E. Leonard, who was successively car accountant, superintendent and superintendent of transportation of the Gulf & Ship Island at Gulfport, Miss., and Hattiesburg, from 1902 until its absorption by the Illinois Central in 1925, has retired from active duty under the pension rules of the latter company. Since 1925 he had been connected with the office of the car accountant of the Illinois Central at Chicago.

B. E. Myers, assistant trainmaster on the Toledo division of the Pennsylvania, has been transferred to the Long Island. **P. C. Adams**, assistant trainmaster-assistant road foreman of engines on the Renovo division at Renovo, Pa., has been transferred to Kane, Pa. **A. N. Stewart**, assistant road foreman of engines on the Renovo division at Kane, has been appointed assistant trainmaster-assistant road foreman of engines at Renovo to succeed Mr. Adams.

Traffic

C. L. Outen has been appointed traveling freight agent of the Virginian, with headquarters at Columbia, S. C.

E. E. Booth, superintendent of the Beaver, Meade & Englewood, has been appointed superintendent of bridges, buildings and construction, with headquarters as before at Forgan, Okla.

C. F. Goldthwaite, assistant director of publicity of the Canadian National Railways, with headquarters at Montreal, Que., has been appointed manager of the advertising department, with the same headquarters.

C. N. Richards, chief of the tariff bureau of the Wabash at St. Louis, Mo., has been promoted to assistant general freight agent, with headquarters at the same point, succeeding **W. E. Mattox**, who has been granted a leave of absence on account of illness. **L. W. Cole**, assistant chief of tariff bureau, has been promoted to chief of tariff bureau, succeeding Mr. Richards.

P. J. McCarthy, assistant general freight agent of the Missouri Pacific at St. Louis, Mo., has been promoted to general freight agent, with headquarters at the same point succeeding **William H. Thompson**, deceased. **H. E. Dunham** has been appointed assistant general freight agent, succeeding Mr. McCarthy. **H. M. Johnson**, assistant foreign freight agent, has been promoted to foreign freight agent, with headquarters as before at St. Louis.

Herbert Bertermann, who has been promoted to general passenger agent of the Cleveland, Cincinnati, Chicago & St. Louis, with headquarters at Cincinnati, O., has been in railway service for more than 31 years. He was born on July 9, 1881, at Indianapolis, Ind., and entered the service of the Lake Erie & Western (now part of the New York, Chicago & St. Louis) in that city on November 15, 1897. From November,

1902, to July, 1904, Mr. Bertermann acted as traveling passenger agent for the Nickel Plate at Muncie, Ind., and he was then advanced to district passenger agent at Indianapolis. On April 1, 1906, he was appointed traveling passenger agent of the Big Four at Indianapolis, where he remained until the following year when he was advanced to



Herbert Bertermann

general agent in the passenger department at Peoria, Ill. He was transferred to Louisville, Ky., on November 1, 1911, and to Columbus, Ohio, on March 1, 1914, then being promoted to assistant general passenger agent, with headquarters at Cincinnati, on January 1, 1916. Mr. Bertermann's promotion to general passenger agent became effective on March 1.

Daniel M. Bowman, who has been promoted to passenger traffic manager of the Cleveland, Cincinnati, Chicago & St. Louis, with headquarters at Cincinnati, O., has been connected with



Daniel M. Bowman

that railway for more than 15 years. He was born in September, 1866, in St. Charles county, Mo., and entered railway service in the passenger traffic department of the Missouri Pacific. Later he held various positions with the

Missouri Pacific, the Southern Pacific, the Kansas City, Fort Scott & Memphis (now part of the St. Louis-San Francisco), the Texas and Pacific, the Erie and the Pittsburgh & Lake Erie. In November, 1913, Mr. Bowman was appointed assistant general passenger agent of the Big Four, with headquarters at Cincinnati, being promoted to general passenger agent, with headquarters at the same point, in June, 1915. Mr. Bowman's promotion to passenger traffic manager became effective on March 1.

Engineering, Maintenance of Way and Signaling

A. B. Hillman, trainmaster on the Belt Railway of Chicago at Clearing, Ill., has been appointed assistant engineer, with headquarters at the Dearborn station, Chicago.

H. C. Munson, office engineer of the Eastern lines of the Chicago, Milwaukee, St. Paul & Pacific at Chicago, has been promoted to division engineer at Sioux City, Ia., succeeding **H. B. Christianson**, who has been transferred to Marion, Ia., where he replaces **E. L. Sinclair**, deceased. **L. D. Hadwen**, who has been on a leave of absence, has been appointed office engineer at Chicago, succeeding Mr. Munson.

Mechanical

C. M. Darden, who has been promoted to assistant superintendent of machinery of the Nashville, Chattanooga & St.



C. M. Darden

Louis, with headquarters at Nashville, Tenn., has been connected with the mechanical department of that railway for 17 years. He spent his boyhood in Richmond, Va., and after attending the Y. M. C. A. night school and the Virginia Mechanics Institute in that city, he entered the service of the Richmond Locomotive Works (now part of the American Locomotive Company) as a draftsman in Richmond. Later Mr. Darden was appointed assistant me-

chanical engineer of the Rogers Locomotive Works at Paterson, N. J., then serving with the Chicago & Alton as mechanical engineer. In 1912 he entered the service of the mechanical department of the Nashville, Chattanooga & St. Louis, at Nashville; at the time of his promotion to assistant superintendent of machinery on March 8 he held the position of mechanical engineer, with headquarters at Nashville.

Special

J. R. Almey has been appointed horticulturist of the Western lines of the Canadian Pacific, with headquarters at Winnipeg, Man., succeeding **G. A. B. Krook**, deceased.

Obituary

Sprague Bostwick, who retired from railway service as assistant general freight agent of the Southern Pacific in 1922, died at San Francisco, Cal., on February 5, at 78 years of age.

Howard Stillman, mechanical engineer and engineer of tests of the Southern Pacific from 1893 to 1924, died at his home at Berkeley, Cal., on February 7, at the age of 73 years.

W. N. Mitchell, general southeastern freight agent of the Baltimore & Ohio, with headquarters at Atlanta, Ga., died at his home in that city on February 9 at the age of 77 years.

BOTH THE NEW YORK CENTRAL AND THE PENNSYLVANIA, effective April 28 with the resumption of daylight-saving time will run their 20-hour trains between New York and Chicago one hour earlier than at present. The Twentieth Century Limited will leave New York at 1:45 p.m., Eastern Standard Time, and Chicago at 11:40 a.m., Central Standard Time; the Broadway Limited will leave New York at 1:55 p.m., Eastern Standard Time and Chicago at 11:40 a.m., Central Standard time. Thus, by daylight saving time, each train will start at the same hours as at present.

* * *



On the Great Northern

Railway Age

Motor Transport Section
Devoted to the
Coordination of Railway and Highway Service

Vol. 86

March 23, 1929

No. 12

Name Registered U. S. Patent Office



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Railway Age

Motor Transport Section

*Devoted to the
Co-ordination of Railway and Highway Service*

Vol. 86

March 23, 1929

No. 12

Why Responsible Operators Favor Regulation

IT has been considered significant—and it is significant—that the more responsible independent interstate motor coach operators are themselves desirous of federal regulation. There may be some question among them regarding the degree of regulation they desire, but most of them seem to be agreed on the general principle. The far-seeing wisdom of this attitude is shown by recent accidents which have occurred to interstate motor coaches. In spite of an apparent desire on the part of the companies involved to present the facts, in the lack of any centralized authority having control the feeling may easily arise that perhaps safeguards against such disasters are not sufficient. The charge is frequently made that many interstate operators can maintain their schedules only by a consistent disregard of state laws regarding maximum speed. Where, because of inadequate equipment and inadequate financial resources, an operator, spurred on by competition, is tempted into taking chances which result in fatal accidents, the result is criticism against the whole industry. There could be no better safeguard of the legitimate motor coach operator than minimum uniform requirements of equipment, safety, service and rates. This would protect against irresponsible competition and hold down accidents to the minimum which may be expected even with the most careful operation. In the absence of adequate federal regulation, bona fide motor coach operators will continue to be harmed by criticisms caused by irresponsible operators who pursue the immediate transportation dollar to the exclusion of all else.

Freight Competition as Serious as Passenger

THE seriousness of the losses of freight traffic to highway vehicles cannot be ignored, even though the total volume of freight traffic does not show such a decrease as that of passenger traffic. The actual loss in net earnings to the railroads through motor truck competition may very well be greater than the loss from highway competition for passenger traffic, even though freight business is still profitable and passenger business is not. Railroad rates no longer are comparable to taxation which no industry can avoid. Traffic no longer passes inevitably over the railroads as do imports through the customs. As a matter of fact, of course, the railroads never did have any such monopoly as indicated in an analogy comparing them to the customs. Nevertheless, such a concept at one time might have had some degree of validity. Now it has none at all. Railroad men—and particularly freight traffic officers—can

well examine the problems of competition, present and prospective, both of highway vehicles and waterways, with the utmost thoroughness. The fundamentals of motor truck transportation ought to be delved into thoroughly with three purposes in mind—to learn the intrinsic possibilities of the business as a revenue producer in itself; to see wherein the truck may be profitably substituted for functions now performed less economically by rail; and, to find ways and means of combining both motor truck service and rail service to provide an all-round transportation service which neither agency, acting alone, can give. If railroad men will experiment with and study the problem of motor truck service as thoroughly as they have already done with motor coach service, there can be no question that the results will be equally profitable, if not more so. The Motor Truck Section of the Motor Transport Division provides the logical centralizing agency for such a study.

How Much Is an Independent Operation Worth?

HOW much ought a railroad pay for an independent motor coach line which it wishes to take over? It may be conceded at the outset that the fair way to proceed in entering a field already occupied is to consider the purchase of existing lines where uneconomic competition is the only alternative. On the other hand there is a limit beyond which the price to be paid for a given motor coach line may be open to serious question. Some years ago a street railway company entering the field of motor coach operation somewhat belatedly, in its efforts to secure quickly control of a great many lines paid as high as \$20,000 merely for the right to operate a single motor coach over a certain lucrative route. To pay an exorbitant price merely for authority to operate brings complexities which in the long run may be embarrassing. A motor coach line is certainly worth the sum of the following: The value (looking to the remaining service life) of all equipment and other property; a going-concern value, based upon the probable losses attendant upon setting up a new company, training an organization and waiting for traffic to develop; and a factor which would give some weight to present and prospective net earnings. A figure arrived at in this manner might be checked against the probable cost to the railroad of alternative methods of meeting the problem which the proposed purchase of the independent operation would solve. The price offered, in other words, ought to be fair. It ought not to place too high a premium on a public gift—which is all an exclusive certificate of convenience and necessity is. Such gifts have, at times, been withdrawn, and capitalizing them at too high a price is not advisable.

Depreciation and Obsolescence

WHETHER physical depreciation or obsolescence should determine the time when motor coaches should be retired is still a debated question. The matter was discussed at some length at the recent meeting of the Motor Transport Division. It seems to be generally agreed that, properly maintained, a motor coach will give several hundred thousand miles of reasonably efficient service. Theoretically at least, there is almost no limit to the life of a coach on this basis. It is well-known, however, that maintenance costs have a tendency to increase with the length of service of the equipment, eventually attaining a point where they are sufficiently high to outweigh the capital savings resulting from the delay in purchasing new equipment. At this point, retirement becomes obligatory in the interest of economical operation. Obsolescence, on the other hand, is a factor into which enter changing styles, competitive conditions and public good-will. Improvements are continually being made in motor coach equipment. Although the peak seems to have been reached, as far as lavish interiors are concerned, other more important changes are constantly being effected. The result frequently is partial or nearly complete obsolescence, long before the coach has reached a point even approaching old age. Obsolete or half-obsolete coaches cannot be operated successfully in competition with more modern equipment, as more than one operator has found. The only recourse, then, is to assign the older coaches to runs where conditions are such that well-maintained equipment, regardless of the fact that it is not the newest, will not drive away patronage. Far from being merely an accounting matter, depreciation and obsolescence enter largely into the affairs of all the departments of a motor coach company.

How Many Motor Coach Lines on Important Routes?

IT is reasonable to expect that there will always be competition between motor coach lines on routes serving important centers of population. Not even the enactment of legislation placing the interstate motor carriers under a system of regulation would be expected to restrict operation over any important highway route to one company. In certain instances, two or more intra-state operators have been given permission by state regulatory authorities to run their motor coaches over the same route in competition with each other. Any federal regulatory legislation which may pass, furthermore, unquestionably will contain a "grandfather clause" which will automatically give official recognition to the public convenience and necessity of two or more competing lines on virtually every major highway route in the country. Is it not reasonable, therefore, to anticipate a day when exclusive certificates to cover any except the most sparsely settled routes will be the exception rather than the rule? By no means all of the state commissions having under their jurisdiction the regulation of motor coach lines have been of one mind in rendering decisions upon like questions. But a tendency to lift the bars slightly, in some instances where such lifting is economically justifiable—as in the case of the Southern Pacific in its application for permission to operate motor coaches in replacement of trains over routes already served by competing highway lines—is already noticeable in a few states, and this tendency

will probably become better defined as time goes on. A certain amount of competition is accepted as a good thing in any business. There should be some competition in the business of motor coach operation. There is already a great deal, and there may be still more.

The St. Louis Meeting of the Motor Transport Division

TO those who have attended meetings of the Motor Transport division regularly, the recent sessions at St. Louis seemed in many respects to have been the most worth-while yet held. The attendance was not up to expectations, and two of the vice-chairmen were unable to be present—significant evidence of the important changes in the motor transport picture of the country which are now in the making. Indeed, several of the most active members of the division were frankly unable to go to St. Louis to discuss motor coaches because they were so busy at home operating them. In all other respects the St. Louis meeting more than fulfilled its promise of proceedings of vital interest to all the rail-ways.

For one thing there was more practical discussion of the problems of motor vehicle and rail car operation than at any previous meeting. Reports of the effect of motor vehicle competition upon the business of the rail-ways constitute information essential to every road, but they have a similarity which detracts from their interest after a time. Surely, by this time, every road in the country knows that it has lost a greater or less amount of traffic to the highway carriers. The proceedings of the meetings previously held should easily have served to convince any doubters of the fact that highway transportation is a factor not to be ignored.

That this fact was appreciated by those who had the program of the St. Louis meeting in charge was evident from the presence on the program of an unusually large proportion of reports on definite problems of motor vehicle operation and co-ordination with rail service. Only a few roads have a substantial amount of experience in motor coach and motor truck operation. The others, many of them newly entered in the field, have much to learn regarding the minor and even the major problems encountered in connection with such work. It is in making available to all the railroads the experience of those which have pioneered in motor vehicle operation, to the end that the newcomers in the business may avoid the mistakes frequently made by unadvised beginners, that the Motor Transport division will perform the most valuable service to the member roads.

It might be well at this time to raise the question as to whether the representatives of the automotive industry may have something of more value to the division than they have been able to offer at meetings of the division held up to this time. Restricted to attendance at the last session of each meeting, they have been able to give little of their knowledge and experience. Many of these representatives of manufacturing companies and associations of motor vehicle operating organizations are experts in highway transportation matters, equipped to advise the railroads to good effect on many matters pertinent to successful operation on the highways. Some thought has been given to changing the program of the division's meetings to provide for an open session at the beginning of each meeting. This would appear to be a step in the right direction.



An A.C.F. Motor Coach in B. & O. West Virginia Service

Motor Transport Division A. R. A. Meets at St. Louis

*104 representatives of 72 roads present at sessions where
motor coach regulation and motor truck competition
were featured in discussions*

THE regular meeting of the Motor Transport Division of the American Railway Association was held at St. Louis from February 26 to March 1 with 104 representatives of 72 railroads in attendance. The first day was given over to the deliberations of the General Committee and the Law Committee and to the meeting of the Motor Coach Section. The second was consumed with discussions of the Motor Truck Section, the third with the proceedings of the Rail Motor Car Section and the final session was the joint conference with the representatives of the automotive industry. In this latter 54 representatives of 31 companies joined the delegates.

In the temporary absence of Chairman A. P. Russell, executive vice-president of the New York, New Haven & Hartford and president of the New England Transportation Company, highway subsidiary of that road, the meeting was called to order by R. L. Fairbairn, manager of the passenger service bureau of the Canadian National at Montreal, Quebec, and chairman of the Rail Motor Car Section. Mr. Fairbairn introduced R. N. Van Doren, vice-president and general counsel of the Chicago & North Western and chairman of the Law Committee of the division. Mr. Van Doren first reported for the General Committee and then proceeded to outline the activities of the Law Committee in the interval since the Detroit meeting in October.

Report of General Committee

In the report of the General Committee were recommendations that the number of meetings of the Motor

Transport Division be reduced from three to two a year and that the next meeting be held at Toronto, Canada, during the second week of November. These recommendations were adopted and the November meeting was designated as the annual meeting at which a majority of member railroads would constitute a quorum. In this connection, however, it was voted that the chairman may call a special meeting at any time or place when such a move seems to him desirable or when such action is requested by a substantial number of the member railroads. Although the foregoing action means that the June meeting will be omitted this year, it is, nevertheless, understood that the meetings will be in June and November of succeeding years with the June meeting of every other year held at Atlantic City in conjunction with the meetings of the Purchases & Stores and Mechanical Divisions of the American Railway Association.

Nominating Committee

A Nominating Committee was appointed to prepare a slate of officers which will be acted on at the November meeting. The membership of this Nominating Committee is as follows: Chairman, M. F. Steinberger, manager of highway transportation of the Baltimore & Ohio; E. Wanamaker, electrical engineer of the Chicago, Rock Island & Pacific; F. S. Hobbs, general manager of the New England Transportation Company; E. A. Cunningham, efficiency engineer of the Canadian Pacific; L. B. Burns, assistant to the general manager of the Seaboard Air Line; G. L. Whipple, general superintendent of transportation of the Union Pacific, and George Mc-

Cormick, general superintendent of motive power of the Southern Pacific. With these recommendations of the General Committee disposed of, Mr. Van Doren proceeded with the report of the Law Committee.

Status of Regulation

This report was an outline of the activities of the Law Committee in its conferences on the Parker Bill for the regulation of interstate motor coaches which was before the house committee on interstate and foreign commerce of the last Congress, but which was not reported to the House by that committee and thus failed of passage. Mr. Van Doren expressed some disappointment that the bill which was outlined at the Detroit meeting had not come before Congress since it was felt at that time that the various interests were satisfied with the measure as then framed. It developed later, however, he said, that the bill did not meet with the approval of some of these interests and hence various conferences and meetings were held, following the Detroit meeting, and some changes in the proposed bill were made.

One of these changes referred to the so-called "Grandfather clause" which provides that any motor coach in bona fide operation over an interstate route on November 1, 1928, should receive a certificate for the continuance of such operations. The change in this connection was in the method by which these beneficiaries of the "grandfather clause" would receive their certificates. In the revised bill they would have been forced to establish and prove the bona fides of their operation and they would do this by answering a questionnaire sent out by the Interstate Commerce Commission. If replies to this questionnaire were satisfactory, the certificates would follow as a matter of course and if such replies were not satisfactory to the Commission the case would be referred to the joint state boards for hearing.

Declaration of Policy in Bill

Another change in the bill was the inclusion of a declaration of policy which read "for the purposes of administration of this act, nothing contained in Section 500 of the Transportation Act of 1920 shall be con-

strued by any joint board, commission or by any court, to express the policy of Congress in favor of any other form of transportation as against transportation by motor vehicles, or the affecting in any manner the issuance of certificates under this act, if the issuance of such certificates, after all pertinent facts and circumstances have been duly considered on their merits, is deemed proper in the public interest; and nothing herein contained shall be construed as a declaration by Congress of the relative importance to the public of the several kinds of transportation." Continuing, Mr. Van Doren said that there were several changes in procedure which the bill provided. It went back to the original idea of joint boards composed of state commissions handling practically all the machinery of the law, whereas, in the former bill, the Interstate Commerce Commission was represented on these joint boards. Had the revised bill passed, the Interstate Commerce Commission would not have entered the situation unless an appeal was taken from the decision of the joint boards, in which case the Commission would have reviewed the record and either affirmed or reversed the decision of the joint board.

Other Changes

Other changes related to features of rate maintenance, the preservation of police powers for the interested states and the exemption of railway motor coach operators from the provision of the anti-trust laws. Mr. Van Doren stated that the foregoing were essentially all modifications which were made in the bill before its submission to the House Committee. This committee, however, referred the bill to the Interstate Commerce Commission and this latter body asked for some definite statement of congressional intent in connection with that section which reads: "In determining whether or not a certificate should be issued, the joint board and the Commission shall, among other pertinent matters, give reasonable consideration to the convenience of and necessity to the public to be served thereby, of the service by motor vehicles applied for, to existing available transportation agencies and service." The Commission thought that the bill should prescribe definitely just what consideration



Pennsylvania Motor Coach with Yellow Chassis and Lang All-Metal Body

should be given to existing means of transportation, that is, whether they (the regulatory boards) should consider the financial needs of one or the other of the parties interested, whether they were to treat them as two entirely different kinds of carriage and therefore in different fields and not requiring much consideration one for the other. Mr. Van Doren stated that this request of the commission, in his opinion, had the effect of postponing action on the bill at the past session.

Following this exposition of the various manoeuvres and changes in connection with the proposed Parker Bill, Mr. Van Doren described a bill which was intro-

duced into Congress by representative Huddleston of Alabama, a member of the House Committee on Interstate and Foreign Commerce. This bill provides merely that motor carriers shall be required to file a bond for the protection of the public.

In closing his remarks the chairman paid tribute to the sympathetic attitude of the House Committee in its co-operation with the various interests who are seeking to formulate a satisfactory bill for the regulation of interstate motor coaches. He said in addition that action on such a measure might be expected at the December session.

Motor Coach Section

Important developments and extensions announced—Depreciation maintenance and joint operation discussed



T. B. Wilson
Chairman, Motor Coach Section

After a brief discussion of Mr. Van Doren's remarks the meeting of the Motor Coach Section opened with R. J. Littlefield, manager of motor coach operations, Boston & Maine Transportation Company, in the chair. He presided in the absence of T. B. Wilson, vice-president and manager of the Southern Pacific Motor Transportation Company and chairman of the Motor Coach Section.

Mr. Littlefield, in opening the discussion, expressed gratification at the interest manifested in the meetings and stated that practically every outstanding railroad in the country which was operating motor coaches was represented. He urged the members to be free in discussion, adding that it was the policy of the Motor Coach Section to be just as helpful as possible to all railroads either already in the motor coach business or contemplating such operations. He next called on R. H. Allison, assistant to the general manager of the Cleveland, Cincinnati, Chicago & St. Louis who read a paper on depreciation of motor coach equipment.

Depreciation of Motor Coaches

This report was a statement compiled from results of a questionnaire submitted to several motor coach operating companies throughout the United States. It held that when motor coaches were in the experimental stage it was quite proper to depreciate them on the time basis, since obsolescence crept in within a short time. The report continued to say, however, that it is questionable whether this method should be used at the present time when obsolescence is no longer as important a factor as it formerly was. While many companies, the questionnaire revealed, prefer to use the time basis for depreciation of motor coaches operating on short routes and accumulating comparatively short mileage, the mileage basis seems to be the most accepted method. The latter

places the life of an economically operated motor coach for depreciation purposes at from 100,000 to 300,000 miles. In this method the estimated life mileage figure, together with the invested value, is considered in determining the rate per mile for depreciation. It was found, however, that some motor coach companies oppose the mileage basis, claiming that after a year's use the motor coach has not the same resale value as the value appearing on their books. The report stated, however, that, while this claim may be well founded, most companies value their property not at the market price but at its value to the business. It was further revealed that the major points covering the method of depreciation employed by the several reporting concerns were: State regulation, type of equipment and geographical location and condition of routes. Most companies limit depreciation to 80 or 90 per cent of the invested value of the equipment, thus allowing from 10 to 20 per cent for salvage or resale price at the time of retirement from service.

Proper Depreciation Basis Important

In conclusion the survey stated that computation of depreciation on a most conservative basis is of the greatest importance, since each year's operation should bear only its proper share of the liability for replacing the depreciating equipment. The canvass revealed also that, of the 25 reporting concerns, 16 are using the mileage basis, while 9 employ the time basis. On the former basis the rates vary from 2½ cents to 10 cents per mile. It concluded finally that whether the mileage or time basis is used would depend entirely upon the judgment of the operator who should be guided by the annual mileage of his motor coaches, their probably useful life, their resale value and the chances of continued need for present equipment. The estimated life, its conclusion continued, must not be so great that the period would extend beyond the time when advancement in design would make the motor coach out-of-date. On the other hand, depreciation periods should not be so short as to underestimate greatly the practical services which may be expected, since the period chosen will directly affect the cost of operation.

The Factor of Obsolescence

In the discussion which followed Mr. Allison's paper, the question was raised as to whether or not the item of depreciation covers also the factor of obsolescence and Mr. Littlefield called upon F. S. Hobbs, general manager

of the New England Transportation Company, to comment upon the point. Mr. Hobbs stated that the New England Transportation Company had taken into consideration the factor of obsolescence in its depreciation computation. He explained that in his company depreciation was on the mileage basis at the rate of about four cents a mile and an estimated life of 225,000 miles. He added, however, that in the unit system of maintenance, which is employed by the New England Transportation Company, the motor coaches are kept 95 per cent efficient, at all times, and thus the life of equipment so maintained is really unknown. Mr. Hobbs continued by describing several varieties of operating conditions which he encounters and stated in closing that in view of these factors he believed his company not to be far wrong in depreciating at 3.5 cents or four cents a mile.

Premature Retirement Sometimes Necessary

Mr. Littlefield here stated, and Mr. Hobbs agreed, that in several cases it was necessary to retire equipment in order to make the service as attractive as that of competitors who are entering the field with newer and more modern motor coaches.

Mr. Van Doren asked Mr. Allison if the questionnaire revealed that most motor coach operators maintain a property investment account against which they charge all retirements. In reply Mr. Allison stated that various methods were found and no general practice could be reported. Here Mr. Littlefield stated that it had been the experience of the Boston & Maine Transportation Company that no two operations are alike and perhaps in no two operations should depreciation be considered in exactly the same manner. He continued to say that his company had some equipment on branch lines making a very small mileage. This equipment was depreciated on the time basis over an estimated life of five years until it developed that these motor coaches making this small mileage could be utilized for more than the allotted five years even though the obsolescence feature were quite marked. In these cases it was found that the question of modern equipment was not extremely important but, Mr. Littlefield added, that nevertheless, his company, generally speaking, had found the mileage basis the fair standard.

Unit Maintenance System Described

After further brief comment on depreciation by C. S. Lake, assistant to the president of the Chesapeake & Ohio, Mr. Littlefield called upon D. V. Gearwar, mechanical superintendent of the New England Transportation Company, to explain the unit replacement maintenance method employed by that operator. Mr. Gearwar in his description of this maintenance system outlined the scope of his company's operations, stating that it had 233 units in service covering 23,000 schedules per month, exclusive of the operation of extra sections, special parties, and deadhead mileage. These latter cover nearly 8,500,000 miles per year. The system endeavors to preclude the penalizing of one garage force to the advantage of another; it removes control from the garage foremen and maintenance that is due while the equipment is in a given territory is completed on schedule. Replacements are made according to the pre-determined life of the various parts of the equipment. On certain equipment, irrespective of the operating condition, generators, starters, distributors, brake diaphragms, air valves, compressors, etc., are removed at a stipulated mileage and replaced with rebuilt, tested parts while those removed are forwarded in especially built containers to base garages for rebuilding and testing. The same holds true on brake relining and built-up toes on brake shoes,

valve grinding and main and connecting rods, bearings and other parts.

Continuing to explain the system, by following a given coach through its various steps the report assumed a particular vehicle had been completely rehabilitated and thus started out at zero miles on maintenance. After operation of 2000 miles it receives oil change, and chassis lubrication, together with an average of twelve other items. Subsequent to the operation of an additional 2000 miles, it would receive all of the features of the first 2000 miles plus 18 more items, and so on, so that as the coach progresses in mileage the renewals, replacements and adjustment of parts and accessories becomes more rigid. At the conclusion of the pre-determined and economic life of the coach in question it is brought to the base garage and there receives complete rebuilding service—power plant, steering columns, front axle, springs, shackles and brake assembling, together with transmission, clutch and drive line differential assembly complete. The unit, when released, is in a mechanical condition the equivalent of the day it was delivered new, barring some possible fatigue in the frame itself. The complete replacement of all units, which includes everything on the new body and frame itself, the report stated, has been developed so that at 3:45 p.m. on the second working day the coach is on the road for a test and final adjustment.

Control of System

Referring to the supervisory control of the system, Mr. Gearwar stated that all garages report daily the odometer reading of each unit which is garaged at their location to mechanical department headquarters where a centralized control is maintained of all motor coaches on the system. As these odometer readings are entered the maintenance schedule numbers coming due are directed to the various garages 700 miles in advance of their becoming due. When work on the unit becomes due the garage foreman has the schedule completed, and reports completion and the odometer reading when concluded. Each sector or garage has a stipulated number of units assigned to its care and scheduling. Headquarters compiles charts and statistics which give each sector its performance in miles per road delay or failure, together with other statistics which places each sector on a competitive basis. In the event of any accessory or part failing before its delivery and replacement comes due, Mr. Gearwar said, it is possible under the system to determine, without error, the individual who built up the unit in question or made the adjustment in the schedule. He concluded by saying that the system has contributed to some considerable extent in the New England Transportation Company's system performance of 96.97 per cent of operating schedules on time.

M. P. Uses New England Maintenance System

Following Mr. Gearwar's remarks, P. J. Neff, assistant to the president of the Missouri Pacific and vice-president of the Missouri Pacific Transportation Company, stated that after investigation of several maintenance systems his company had decided to adopt the New England Transportation Company's system for its highway subsidiary maintenance work. In reply to a question from Mr. Littlefield, Mr. Gearwar stated that the mileage, before the complete unit replacement is made, varies with different motor coaches, the range being from 50,000 to 80,000 miles. In reply to another question, by Mr. Littlefield, Mr. Gearwar stated that as a factor of safety in operation his company is willing to compromise on wear here and there on small things and thus perhaps occasionally make a premature replacement in order to

preclude the possibility of a road failure or delay. In this connection he explained that occasionally there will be a case where there is a little life left in a component part which is removed. He added, however, that this remaining life is not destroyed but is utilized in a rebuilt unit.

Replying to another inquiry as to the labor cost of making a complete replacement, Mr. Gearwar cited a recent instance wherein a complete overhauling was done in 100.7 man hours. As to maintenance cost on the system, the speaker said that it might be placed between 4.7 cents and 5.7 cents per mile.

Why Railroads Should Operate Motor Coaches

The remainder of the forenoon session was consumed in the discussion of the question "Why the Steam Carriers Should Operate Motor Coach Services" and Mr. Littlefield called upon Mr. Neff to speak on the question. Mr. Neff stated that since 1920 the railways' passenger business has declined \$312,000,000 a year, whereas if the growth from 1920 to 1927 had progressed along its normal course, instead of a decline of \$312,000,000 annually, there should have been an increase of \$400,000,000 annually in passenger revenues on Class I railroads. During that time, he continued, the number of licensed automobiles has increased to 26,000,000, of which 92,000 are motor coaches. These latter include a limited number in school service but the speaker believed that practically all of the 92,000 were operated for hire on the highways.

Proceeding from the foregoing premises, Mr. Neff said the question arises as to whether the passenger business of the railways has gone to the motor coach lines or to private automobiles and explained the questionnaire which had been sent to all Missouri Pacific agents, about 2000 in number, to gather concrete information on this point. The replies revealed that independent motor coach operators in Missouri Pacific territory had collected more in gross revenue since 1920 than has been the decline in Missouri Pacific passenger revenues during the same period. With this information in hand Mr. Neff continued, the Missouri Pacific visited those railroads which were operating motor coaches in order to study the possibility of inaugurating such a service in its own territory. These interviews with motor coach operating railroads resulted in the decision of the Missouri Pacific to enter the motor coach business themselves. It was concluded in this connection that if the highway operations did not yield a profit on their own account they would bring an indirect profit in the savings they permit the railroad.

The speaker stated he was much gratified to report that in the three months in which the Missouri Pacific Transportation Company has been in operation its major coach lines have not operated at a loss, and added that there is in prospect for the next few months a considerable saving in train-miles on the railroad by reason of recent purchases of motor coach lines in the territory.

In concluding, Mr. Neff stated it to be his opinion that the railroads cannot afford to stand still on the motor coach method of transportation, any more than they could hesitate a hundred years ago when stage coach lines were being replaced with steam railroads. He further stated it to be his belief that railroads who do not enter the motor coach business are going to regret it very much in the future.

M. P. to Expand Highway Operations

In response to a question from Mr. Littlefield, Mr. Neff stated that the Missouri Pacific operations at that time covered 2570 route miles and 30 days from that

time the routes would be extended to cover 4000 miles. Calling for a further discussion on the question of steam carriers operating motor transport service, Mr. Littlefield drew from H. Z. Maxwell, assistant general solicitor of the Pennsylvania, the statement that his company has found it easier to get permission from a commission to withdraw an unprofitable train service if it is prepared to operate a subsidiary highway service at the time the application for the withdrawal of the railroad service is presented. Mr. Littlefield agreed and suggested that such had been the experience of New England railroads.

Report on Specifications Code

With the opening of the afternoon session, Mr. Littlefield read the report of the motor coach section relative to the indorsement of the uniform motor coach specification code sponsored by the Society of Automotive Engineers and the National Automobile Chamber of Commerce. He expressed disappointment that very few railroads had offered any opinion on the code and thus a complete report had not been formulated. He urged that those roads that have not received a copy of the uniform code obtain one in order that some findings on the subject could be brought into the next meeting. Turning to the work of the regional committees Mr. Littlefield called upon C. W. Parrish, assistant to the general superintendent of transportation, Norfolk & Western, to report for Regional Committee No. 1. Mr. Parrish stated that his committee held a meeting at Atlanta in January, at which it was found that only five roads in the region were operating motor coaches. At the Atlanta meeting, he continued, much of the discussion was concerned with the pending legislation in Washington, sponsored by the Post Office Department, to have all motor coach lines designated as common carriers and to authorize the Interstate Commerce Commission to fix rates for carrying mail on motor coaches. There followed considerable discussion on the carrying of mail by motor coaches and the practices in this matter on the various motor coach routes throughout the country. The outcome of such discussion was the adoption of a motion instructing the chairman to confer with the railway mail pay committee in regard to the developments in mail handling and the compensation for such handling by motor coach lines.

With this mail question disposed of, W. M. Fenwick, general passenger agent of the Missouri-Kansas-Texas and chairman of Regional committee No. 2, outlined motor coach developments in the territory assigned to that committee. Mr. Fenwick stated that although the region is extensive and comprises a great many railroad lines the great majority of these lines had not become highway minded until the past few months. One of the railroads he added, however, had been engaged in motor coach operations for several years, but the committee had not yet been able to interest officers of that line in the motor transport division. The speaker continued to say that the important activity in the region was the recent entrance of the Cotton Belt and the Missouri Pacific into the highway field. With this presentation completed Mr. Fenwick yielded the floor to R. H. Crozier, general passenger agent of the Spokane, Portland & Seattle, and the chairman of Regional committee No. 5. Mr. Crozier stated that the most important development in the fifth region had been the activities of the Southern Pacific.

Activities in the East

Mr. Littlefield himself reported for Regional committee No. 7, and called upon R. K. Stackhouse, general superintendent of stations, transfers and motor services on the Pennsylvania, to outline the recent highway activities of that road. Mr. Stackhouse read a statement

regarding Pennsylvania motor coach operations. In this statement the highway policy of the road was outlined and the recent purchase of the three motor coach lines from the Philadelphia Rapid Transit Company was announced. These developments on the Pennsylvania as outlined in the statement read by Mr. Stackhouse were announced in the *Motor Transport Section*, issues of January 26, page 284, and February 23, page 510. Elaborating on the foregoing Mr. Stackhouse stated that it would not be the policy of the Pennsylvania to compete unduly with existing motor coach companies nor, on the other hand, would the road purchase any great number of these independents. He added that it would be the policy to extend the highway development wherever conditions warrant it. He regarded the question of terminals a very important one and stated that the Pennsylvania is using the Waldorf Terminal and Pennsylvania Station in New York and also in other cities railway stations and ticket agencies are utilized. In closing he said that the Pennsylvania realizes that it has been somewhat slow in entering the highway field, but much of this delay was caused by the denial in 1926 of a charter for a highway subsidiary by the State of Pennsylvania. Asked by Mr. Neff if the motor coach lines of the Pennsylvania sold through tickets in conjunction with other motor coach lines, Mr. Stackhouse replied that it was the policy to continue any traffic arrangements which were in effect on lines acquired.

Pennsylvania Applications Pending

In response to further questioning the speaker stated that the Pennsylvania now has pending before the Public Service Commission of Pennsylvania an application for a route from the Delaware River to the Ohio-Pennsylvania state line. When the question was raised as to the attitude of the Commissions in regard to applications for permission to operate over a motor coach route already covered by another operator, J. S. Selby, general passenger agent, Reading Transportation Company, volunteered the information that his company has a number of lines in Pennsylvania and New Jersey on which permission has been granted to operate from station to station, while the pre-existing lines continue to do the local pick-up business. The discussion of the Pennsylvania operations was concluded by a statement from Mr. Max-

well explaining the methods and practices of filing tariffs and baggage handling. When Mr. Littlefield called for discussion of further subjects, Mr. Neff of the Missouri Pacific distributed copies of forms by which the motor coach operations of his road are controlled. These forms were explained in detail by Mr. Neff who also answered questions of members regarding the control system.

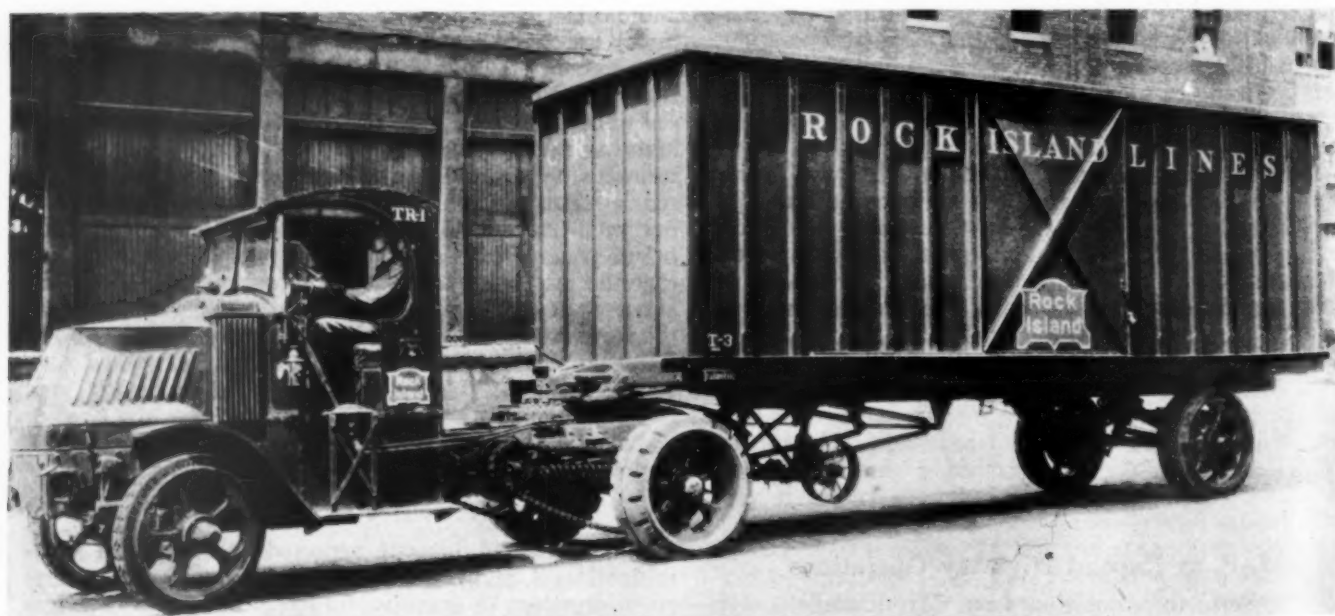
Joint Operation of Motor Coaches

Mr. Littlefield here turned the discussion to "Joint operation of motor coach service by rail lines between such points as St. Louis-Kansas City, St. Louis-Chicago, Kansas City-Chicago, and other places where independent inter-state operators are making serious inroads on the long haul passenger travel." In this connection Mr. Maxwell of the Pennsylvania stated that his road has found such a situation several times and mentioned one instance where there are about six rail carriers and two or three interurban railways and motor coach lines. This, he added, is a territory where a railway motor coach line is more or less needed and thus negotiations are under way to persuade the interested railways to institute a joint application for highway operation. Commenting further upon this question of joint operation Mr. Neff referred to the St. Louis-Kansas City situation and stated that there are four of the major rail lines in this territory to which a highway generally speaking is parallel. One of these railroads, Mr. Neff said, applied to the commission in Missouri for a highway certificate which was denied. In the opinion of the speaker the application was denied because all the railroads did not apply jointly and thus he considered that a study of the question would be worth while in any territory presenting a similar situation.

Southern Pacific Active

In the absence of Chairman Wilson several members from Pacific Coast territory outlined the activities of the Southern Pacific Motor Transport Company from such information as they had obtained in conversation with Mr. Wilson. One of these speakers said that the Southern Pacific had been exceedingly active in the establishment and extension of services as well as in the presentation of applications in California.

Here Fred E. Pettit, Jr., assistant general solicitor,



Mack Tractor with Trailer in Rock Island Freight Service

Los Angeles & Salt Lake, asked if some members identified with roads which are operating motor coaches would explain the arrangements for baggage handling. H. F. Fritch, passenger traffic manager of the Boston & Maine, and president of the Boston & Maine Transportation Company, explained the practice of this latter concern. He stated that baggage is handled on motor coaches on lines where train service has been discontinued and that this arrangement has resulted in no dissatisfaction on the part of the passenger. William E. Lowes, assistant to the passenger traffic manager, Baltimore & Ohio, stated that while his road does not honor motor coach tickets on its trains, it will carry on trains baggage checked on a motor coach ticket. Mr. Hobbs of New England Transportation Company also explained the baggage handling practices on his line. He stated that a standard adopted in 1925 and still existing is a 40-in. baggage compartment with 36-in. doors on each side, so that luggage may be loaded on unloaded from either side of the coach. In the observation type of coaches, this speaker continued there is available a baggage compartment which will hold three steamer trunks and at least one grip for each of the 29 passengers. In connection with the question of whether or not passengers object to riding in motor coaches with baggage piled

in the rear, Mr. Hobbs said that it had been the experience of his company that most people like to have their baggage with them at all times.

Importance of Terminals

There was also included in this section's discussion a paper on the importance of motor coach terminals in large cities. This paper stated at the outset that experience seemed to demonstrate the advisability of having terminals located easily accessible from the important sections of the cities served. Thus it is desirable to get the location as near as possible to the center of the city, taking into consideration traffic laws and traffic congestion and the expenses in maintaining a station to give the people necessary service that they demand. With reference to the consolidation of terminal facilities with other motor coach lines, the report stated that such a merger is not always desirable. It continued to describe terminal location practices in several of the larger cities and closed with a brief discussion of the terminal problem in smaller places. The foregoing report was received too late to be read at the meeting, but was nevertheless included in the record. The discussion of baggage handling, however, closed the session of the motor coach section.

Motor Truck Section

Serious loss of freight traffic to highways indicated in reports on competition in various regions



G. C. Woodruff
Chairman, Motor Truck Section

Chairman Russell appeared to open the sessions of the Motor Truck Section on the morning of February 27. This session convened after the members had returned from the breakfast at the National Hotel, National Stock Yards, Ill., where they had been guests of E. F. Bisbee, vice-president, East St. Louis Junction Railway. Chairman Russell in his opening remarks commented on the

Chairman G. C. Woodruff, assistant freight traffic manager, New York Central. Mr. Neff announced that the Missouri Pacific had arranged to provide motor coaches for the members who wished to visit the Jefferson Memorial where the Lindbergh trophies are housed, during the noon recess. Several of the members made this trip for which a motor coach was also provided by the Twin Coach Company.

Turning to the work of the Motor Truck Section Mr. Neff stated that he believed discussion on the relative types of equipment and appliances should be limited and thus more time could be given to the development of information which would interest the railroads in connection with the operation of motor trucks. He then called on C. J. Chenworth, engineer-assistant to the vice-president, Atlantic Coast Line, to report for Regional committee No. 1. Mr. Chenworth stated that a meeting of the Regional committee was held at Atlanta in connection with the meeting of the motor coach Regional committee and the rail motor car Regional committee. Mr. Chenworth's report was a summary of replies received to a questionnaire which had been distributed throughout the region.

Reports of Regional Committees

This questionnaire revealed that the railroads in Region No. 1 are using motor trucks only to very limited extent and that such use is principally all in connection with the interchange of l.c.l. freight at terminals and in connection with motor coach lines for handling express, baggage and mail. Only three companies, it continued, reported owning and operating motor trucks in revenue service. Two of these latter operate in intra-state line service, while the third has both intra-state and interstate line service operation. The three companies reported ownership of six trucks operating over 350 route miles. Elaborating on the foregoing the report stated that the

situation in regard to proposed federal legislation for the regulation of interstate motor coaches, and followed such comment by reading a letter of greeting to the Motor Transport Division from R. H. Aishton, president of the American Railway Association. He next called attention to the recent appointment of R. A. C. Henry, director of the bureau of economics of the Canadian National, as Deputy Minister of the Department of Railways and Canals of the Dominion of Canada. Mr. Henry had in the past, been actively identified with the work of the Motor Transport Division as a representative of the Canadian National at its meetings. Accordingly a motion was adopted directing that the congratulations of the Motor Transport Division be transmitted to Mr. Henry and also to the Dominion of Canada.

This concluded Chairman Russell's remarks, and the meeting of the Motor Truck Section opened with Mr. Neff of the Missouri Pacific presiding in the absence of

Atlantic Coast Line operates one truck in intra-state line service over a 24-mile route. No rates are published in connection with this operation as only mail, express and supplies are handled, except on one end of the route where the truck operation partially replaces local freight service. In this latter, the truck handles small freight packages under rates published in the regular railroad tariffs; revenues are included in the same primary accounts as for steam service and expenses are handled in like manner. This operation has been unprofitable from a strictly revenue standpoint, but it provides a service essential to other operations of the railroad.

Railroad Truck Operations in South

The East Tennessee & Western North Carolina, through its subsidiary the East Tennessee & Western North Carolina Transportation Company, owns and operates two trucks in interstate line service over 200 route miles and one truck in intra-state line service over 100 route miles. In this operation the subsidiary handles l.c.l. shipments for the railway under contract. These shipments are billed by the railroad and the charges collected by railroad agents. Store-door delivery is provided within certain limits. The charges for the services are included in tariffs on file with the Interstate Commerce Commission. This operation has been profitable and in addition has resulted in a saving in railroad expenses.

The Nashville, Chattanooga & St. Louis through its subsidiary, the Nashville, Chattanooga & St. Louis Motor Transit Company, owns and operates two trucks for handling baggage, mail and express, in connection with a motor coach operation. The operation is over 27 route miles at an approximate average cost of 30 cents a mile. The motor coach service, in connection with which these trucks are operated, was inaugurated to replace passenger trains. The truck operation has been unprofitable in itself, but it nevertheless permitted a reduction of losses on passenger train services.

No railroad in the region reported the operation of motor trucks which it did not own, although several reported contractual relations with local trucking companies at various points for the transfer or interchange of l.c.l. freight with other lines. One road operates tractors and trailers for interchange between its freight houses and local steamship wharves while the several railways entering Cincinnati utilize the interchange services of The Cincinnati Motor Terminals Company.

The Atlantic Coast Line has arrangements with local trucking concerns for the handling of l.c.l. freight at Norfolk, Va., Plymouth and Fayetteville, N. C., and Ozark and Dothan, Ala. The Central of Georgia operates two tractors with 20 trailers for the transfer of l.c.l. freight from its freight houses at Savannah to the piers of the Ocean Steamship Company and the Merchants & Miners Transportation Company. This road has also entered into a contract for the handling of l.c.l. interchange work at Atlanta and for the movement of l.c.l. freight between Atlanta and two nearby local stations. This station-to-station movement is paid for on a tonnage basis and the estimated savings thereby effected are approximately \$300 a month. The Louisville & Nashville has contracts with trucking companies at several of the more important cities for the transfer of l.c.l. freight between its stations and connecting lines. The Mobile & Ohio reported certain arrangements for terminal haulage through agreements with truck operators.

Motor Truck Competition in South

The report stated that comparatively few of the replies received contained any information with respect to the effect of motor truck competition on traffic and reve-

nues of the reporting carrier. Most of the reporting roads stated that highway competition had affected passenger travel materially and express business to a small extent. One railroad, however, made a study of the amount of cotton which moved by truck in the territory served by its rail lines from August 1 to October 15, inclusive, of the years 1927 and 1928. This study yielded the following figures:

Number of Bales of Cotton Moved by Truck and Percentage of Total Movement

State	(August 1 to October 15) 1927		1928	
	Bales	Per Cent	Bales	Per Cent
Virginia	1,450	44.7	946	32.1
North Carolina	29,392	31.6	33,368	52
South Carolina	21,045	9.2	27,590	19.4
Georgia	232	1.3	428	2.5
Alabama	485	0.7	818	2.5
Florida	20	1.6	100	8

With reference to the cotton shipments received at one southern port, the study stated that this tonnage normally comes from points within a radius of about 150 miles. From September 1 to December 31, 1927, there were 52,971 bales of cotton or 76.5 per cent of the total moved into the port by rail and 16,260 bales or 23.5 per cent moved by truck. During the corresponding period of 1928 there were 33,475 bales or 43.2 per cent moved by rail, whereas the truck movement amounted to 43,998 bales or 56.8 per cent. This road estimated that losses in revenue resulting from shipment of cotton by truck during the period mentioned in 1927 was approximately \$38,000 and for the same period in 1928 this loss amounted to \$103,400. During the past two years, the survey continued, a substantial proportion of the eastern North Carolina strawberry crop has moved to local and to northern and eastern markets by truck. In 1927 the total movement of strawberries from the section was 574,107 crates. Of this number 20,842 crates, 3.6 per cent or the equivalent of 92.2 carloads were shipped by truck, practically all of the shipments going to cities in the Middle Atlantic States. The total shipment in 1928 amounted to 603,638 crates of which 57,442 crates, 9.5 per cent or the equivalent of 251.4 carloads moved by truck. Other railroads in the region also reported losses in freight traffic because of the motor truck competition, although there was no abandonment of rail lines reported on account of such inroads.

Motor Truck Cost Figures Sought

In commenting upon Mr. Chenworth's report Chairman Russell stated that he thought it would be exceedingly helpful to railways contemplating motor truck operations if cost figures on such operations were supplied in detail by those companies that have already had experience along that line. There followed here considerable discussion on this question of costs and what items should properly be included in arriving at a cost figure.

The question then arose as to difficulties encountered by the regional committees in securing the information for their reports. Here Mr. Lake of the Chesapeake & Ohio paid tribute to the work of Mr. Chenworth's committee which he thought should be congratulated on what they had been able to do. Commenting on this same point G. W. Lupton, assistant to the vice-president, Atchison, Topeka & Santa Fe, suggested that this question of securing the proper information is of such vital importance that the railroads in the different territories can well afford to detail a man whose exclusive duties would be the compilation of data for the regional committee. Mr. Maxwell of the Pennsylvania thought that a distinction should be made between the various types of information desired. Many roads, he continued, do

not desire to divulge their plans, but on the other hand they would raise no objections to the collection of information with regard to highway competition in their territories. This latter information, in the opinion of the speaker, should be complete.

Chairman Russell spoke briefly on this question of obtaining information and suggested that it was the purpose of the division to permit a free expression of thought on the problem of highway competition, which is eating into the revenues of the railways. Following this Mr. Lupton expressed agreement with the Chairman and insisted on his previous contention that each railroad should assign a man to supply the regional chairmen with such information as was desired. He added that the railroad would find few instances in which they could spend a little money to such good advantage. The question was referred to the General Committee.

Regional Committee No. 2

Mr. Neff, who was chairman of Regional Committee No. 2, said that this body had experienced the same difficulty as was discussed in the foregoing in obtaining concrete information. With the exception of one road, each of the lines in the region reported that they were not operating any motor trucks although the Santa Fe reported that the Santa Fe Transportation Company, a subsidiary of Fred Harvey, with headquarters at Santa Fe, N. M., operates six motor trucks, three of which are used in road service between Santa Fe and Leamy, a distance of 19 miles, and three others being used in terminal shop and store house service.

The Rock Island reported that through a contract with the Rock Island Motor Transit Company, it operates a truck service over the 19 miles between Chicago and Blue Island, Ill., and intermediate stations for the purpose of saving some local freight train mileage and to effect prompt delivery on l.c.l. freight.

Mr. Neff continued to say that since the questionnaire was distributed the St. Louis Southwestern, through its subsidiary the Southwestern Transportation Company, has inaugurated a comprehensive system of freight truck routes. No representative of the Cotton Belt was present at the session, so Mr. Neff explained briefly what he understood to be the plans of that road, from information he had received in conversation with D. W. Russell, president of the Southwestern Transportation Company.

Competition for Livestock Traffic

Mr. Neff next suggested that the statement of motor truck operations furnished the members who visited the National Stock yards be incorporated into the record. The speaker interpreted these figures to indicate that the equivalent of 11,214 car loads of hogs, cattle, sheep, horses and mules were unloaded at the National Stock Yards from motor trucks in the years 1927 and 1928, which from supplementary figures seem to be the equivalent to something like 10 per cent of the total gross receipts of the stock yards during that period. He continued to say that the statements indicate a tremendous increase amounting to almost a doubling in 1928 over 1927, and suggested that it is easy to visualize what may happen if this is a sample of what is going on at this and other important stock yards.

In this connection F. Hartenstein, assistant to the general manager of the Lehiga Valley, raised the question as to whether the origin of this motor truck traffic into the stock yard was at points competitive with

the railroad. Mr. Neff replied that he had raised this same question and learned that practically all of the stock came from a radius of 150 miles of St. Louis, but could not say how much was competitive. Here Mr. Lupton suggested that all this traffic was competitive since it must either move by rail or over the highways, and Mr. Neff agreed with this. The latter continued to state that he attempted to get some accurate figures on the amount of cotton which was trucked in region No. 2 but was unable to obtain anything very definite. He expressed it to be his knowledge, however, that at the ports of Corpus Christi, Houston and Galveston, Texas, during 1928 there were approximately 300,000 bales of cotton trucked into these points and in an effort to meet the competition the railroad had reduced the rate on cotton by one-half, for a limited period of time, in order to see what the result of such rates would be. The reduced rates, however, did not stop the trucking operations. With further remarks from Mr. Neff on the effect of truck competition in Missouri Pacific territory, the morning session was closed.

The afternoon meeting opened with the report of regional committee No. 3 which was made by B. J. Feeny, Supt. Fuel Conservation of the Illinois Central in the absence of Chairman B. O. Johnson, assistant to the president of the Northern Pacific. This report consisted mainly in a list of the committee members. A few replies were received to the questionnaire sent out to member roads. One of these stated that it was not interested in trucks at this time, but was interested in motor coaches. Another did not think it necessary to be represented on the committee and none reported any motor truck operations.

Competition in the Northwest

This was followed by the report of Regional Committee No. 5, read by H. L. Snyder, special representative of the general manager, Union Pacific, in the absence of Chairman J. P. O'Brien, general manager of the Oregon-Washington Railroad and Navigation Company. This report revealed that in the state of Washington there are 106 truck lines operating 394 vehicles; Oregon, 107 truck lines operating 604 vehicles; Idaho, 38 truck lines operating 59 vehicles; Montana, 40 truck lines operating 55 vehicles; and Wyoming 50 truck lines with no information as to the number of units in operation. These figures represent an increase for 1928 over 1925 of 7 companies in Washington, 25 in Oregon. All of these truck lines, the report continued, serve practically all points that are now served by rail with some interior or off rail service. A large majority of the trucking companies are old and established concerns while those recently organized are pioneering new routes. The fixed capital of all these companies in Washington amounts to \$1,907,914 and in Oregon this figure is \$1,938,256. None of these truck lines are owned and operated by railroads. They are operated under certificates of convenience and necessity, in the state of Washington while no such certificate is required in Oregon. The business of the Washington truck lines increased 21.97 per cent during 1927 over the 1925 figure, while from 1926 to 1927 the business of the Oregon lines increased 39.18 per cent. These Washington lines handled 326,446 tons of freight during 1927, while the Oregon lines handled 526,165. The respective gross revenue figures are \$2,291,944, and \$2,989,705.

M. F. Steinberger of the Baltimore & Ohio and chairman of Regional Committee No. 6, was unable to be

present at the meeting but J. L. Hayes, assistant general freight agent of that road, reported that the committee of this region hoped to have a comprehensive statement for the next meeting. He added that the Baltimore & Ohio has no further truck operations than were reported at the previous meeting. This B. & O. operation is the one among stations between Baltimore, Md., and Washington, D. C., but not to and from Baltimore and Washington proper. Mr. Hayes, in reply to Mr. Neff, was unable to give cost figures on the operation, whereupon Mr. Neff again suggested the advisability of developing some accurate cost figures to aid railways in making a decision as to the advisability of entering the motor truck field.

On this cost question A. W. Towsley, assistant vice-president of the Rock Island, stated that in a recent issue of the *Railway Age, Motor Transport Section*, there appeared an article on the operation of tractors and trailers by his road in the Chicago terminal district. [The article referred to by Mr. Towsley appeared in the *Motor Transport Section* of January 26, page 285].

That article, continued Mr. Towsley, gives the tonnage and the cost and a great deal of information which he thought might be of value to the members. The cost figures, he added, were carefully compiled on this operation, which is practically all intracity, through and local about 80 miles per day, with one ten-ton truck and four eight-ton trailers. Commenting upon these remarks, Mr. Neff stated that he had read the article with a great deal of interest and found in it wonderful information on the cost of a city operation. He suggested that those members who had not yet seen the piece might read it with profit.

Pennsylvania Regards Truck Competition Serious

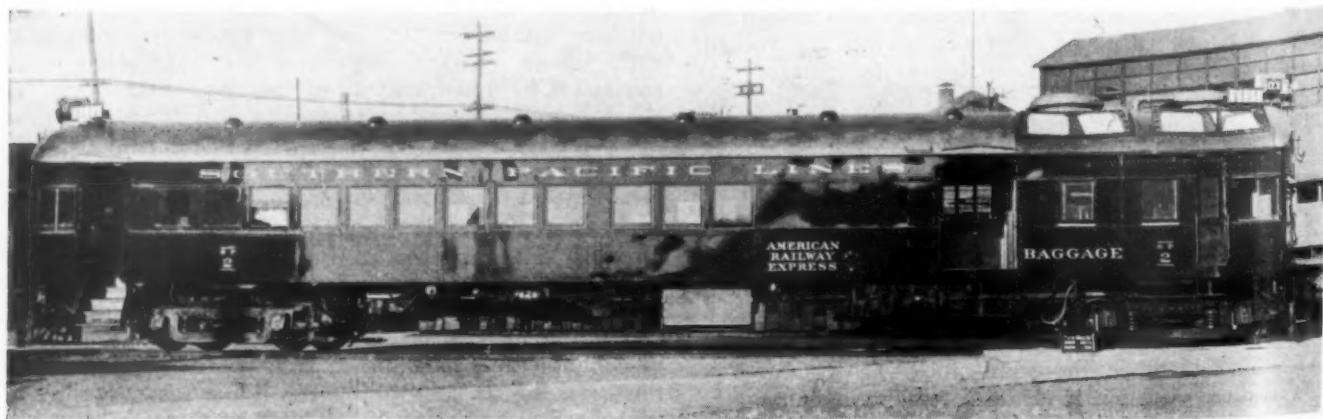
There was no formal report for Regional Committee No. 7 and Mr. Maxwell of the Pennsylvania suggested that representatives of railroads in that district might give information as to any trucking developments on their respective lines. For the Pennsylvania, this speaker stated that his road has no so-called line haul trucking. They have, however, station-to-station trucking under contract in the interests of economy in railroad operation. He added that the Pennsylvania has been studying the competitive situation and believes it to be very serious. In this connection, he continued, it is the belief of his road that the loss sustained by the inroads of the motor coach competition is nothing compared to the loss which will result from motor truck ac-

tivities if the railroads do not act. The container, he said, will no doubt take care of some of this competition as far as l.c.l. traffic is concerned, but he nevertheless regarded the important feature in the future to be the carload business, which might be lost if railroads are not alert.

When Mr. Maxwell stated that he could supply no figures on the cost of motor truck operation F. J. Carey, manager of trucking operations of the Boston and Maine Transportation Company, read into the record some cost figures on several different types of operation which are conducted by his company. Mr. Carey pointed out in this connection that figures will vary according to the different factors in each particular situation. This completed the discussion on the regional committee reports.

Regulation of Motor Trucks

The attention of the members was next directed to the question of what should be the attitude of railroads with respect to the regulation of motor trucks. There followed considerable discussion of the proposition, after which Mr. Van Doren suggested that there was a practical side to the situation in as much as regulatory legislation could not reach all motor trucks. The reason for this is that many of them are in the contract haul and many others are owned by concerns operating them for the transportation of their own products. He pointed out that after an exhaustive study the Interstate Commerce Commission advised against the regulation of trucks at this time. Chairman Russell agreed with Mr. Van Doren in this connection. Extending his remarks on the question the Chairman suggested that much is to be said on the question of highway use and added that if railroads are to enter the highway freight transportation business, as some likely will, they must meet the condition of the independent who operates without regulation and be prepared to perform a store-door delivery that the railroads heretofore have rather shunned. There followed considerable further discussion on this question of motor truck regulation until the time of the Motor Truck Section's adjournment. In closing the session, Chairman Neff announced that the Missouri Pacific would welcome all members, their friends and representatives of the automotive industry, who were on hand for the joint session, at the dinner which was tendered by his road at the Hotel Jefferson that evening. The speaker at this dinner was Samuel O. Dunn, editor of the *Railway Age* who took for his subject "Modern Transportation".



Rail Motor Car Built by the J. G. Brill Company for the Southern Pacific

Rail Motor Car Section

Justification for replacing steam trains with rail motor cars and handling charges in joint facilities feature discussions



R. L. Fairbairn
Chairman, Rail Motor Car Section

The sessions of the Rail Motor Car Section were held on the third day with Chairman R. L. Fairbairn, manager, passenger service bureau, Canadian National, presiding. Chairman Fairbairn immediately called upon J. K. McNeillie superintendent, Delaware & Hudson, to read a paper on "Reliable Formula on Which to Base a Decision as to Whether the Purchase of Self-Pro-

pelled Equipment to Replace a Steam Train is Justified." In this paper it was stated at the outset that no comparison of steam train and rail motor car operating costs was intended. It next pointed out that where earnings or the volume of traffic handled on steam trains do not warrant the expense of steam operation a decision must be made as to whether service should be withdrawn, a mixed train service substituted, or some method of continuance provided because of orders from regulatory bodies, value of the line as a long-haul feeder, relief of through trains from local work, or the desire to maintain suitable public relations.

If a decision be reached that the service must be continued, the report recommended that information as to the volume of traffic which may reasonably be anticipated be obtained. From such information there could be determined the rail motor car equipment necessary to cover the run. Surplus steam equipment could then protect the run at times of peak demand. The report continued to discuss the design, power plant, method of control units and crew requirements on rail motor cars. It proceeded to outline a method whereby a comparison of estimated motor car operating costs could be made with steam operating costs and thus an intelligent decision reached on the question.

Handling Charges on Rail Motor Cars

Following the presentation of this paper, the question was raised as to the handling and charges in connection with rail motor cars entering joint facilities. There followed considerable discussion on this point and the necessity for the development of some uniform practice in the matter.

F. Hartenstein of the Lehigh Valley here presented some figures on the operation of rail motor cars as compared with the costs of steam operation. He stated that the Lehigh Valley owns and operates 22 rail motor cars of different types and design and added that this road has never experienced any difficulty since these units have been in service in maintaining passenger schedules as rigidly as these are maintained under steam operation.

Mr. Hartenstein's remarks precipitated considerable discussion during which he answered several questions on the figures and other aspects of the Lehigh experience which he had outlined.

The Gasoline Tax

L. R. Burns, assistant to the general manager, Seaboard Air Line, raised the question as to the status of gasoline used for rail motor car operation under the various state gasoline taxes. On this point Mr. Van Doren suggested that exemptions were granted in several states and such exemptions were reasonably easy to obtain if the situation is called to the attention of the legislature.

Mr. Burns then proceeded to report for Regional Committee No. 1 of which he is chairman. He stated that there has been practically no change in the operation or purchase of rail motor cars in his district. He added, however, that additional operations were contemplated by two lines.

Distillate as a Fuel

For Regional Committee No. 2, Chairman E. Wanamaker, electrical engineer of the Rock Island reported that it was the plan of his committee to meet that afternoon in order to outline the scope of its future activities. Mr. Wanamaker continued, however, to read some statistics of rail motor car operation costs which were gleaned from the experience of the Rock Island with this type of equipment. In this connection Mr. Wanamaker stated that if his road had to burn gasoline it would not be tempted to advance as far into the rail motor car field as it has. The Rock Island uses distillate as fuel for its rail motor cars. This is obtained at a cost of three or four cents a gallon. Mr. Wanamaker explained that the word distillate many not mean much but he thought that his designation of it as a domestic furnace oil would explain what the product was. The engines, he said, carboret the furnace oil although some of the semi-diesel engines are really solid injection oil engines. The next few years the speaker thought would determine for what service the different types of engines are best adapted. Mr. Wanamaker continued to explain the experiences of the Rock Island in connection with the operating performance of engines fuelled by this distillate. There followed considerable questioning of the speaker on his experiences with the fuel.

There was no report from Regional Committee No. 6 and that of Regional Committee No. 7 was made by Chairman J. K. McNeillie of the Delaware & Hudson. He stated that of the 45 lines assigned to his committee 32 operate rail motor cars either with or without trailers and added that practically every type of motor car equipment could be found in the region. The 32 roads reported 191 rail motor units in operation, 70 with mechanical transmissions and 121 with electrical.

The daily mileage he added varies according to local conditions, but the average is from a minimum 11 miles a day, made by a mechanical transmission unit of 65 rated horse power having a crew of two men, to a max-

imum of 366 miles per day made by 440 horse power electrical transmission unit. In this latter operation there is hauled one passenger trailer and the train is operated by a crew of three men.

The report of Regional Committee No. 5 was read by H. H. Hummel, assistant to the general superintendent of motive power, Southern Pacific, in the absence of Chairman George McCormick, general superintendent of motive power, Southern Pacific. Mr. Hummel stated that Mr. McCormick was not appointed chairman until the Detroit meeting and that since that time he has been endeavoring to get a committee together. Some roads, however, have not manifested any interest in the organization.

As far as the Southern Pacific is concerned, Mr. Hummel said, that this road, during three previous weeks, had placed in operation a gas-electric rail car, 550 horse power and expected to get a second unit of 360 horse power with triple power plant. In addition, the Southern Pacific plans to enter the market for nine additional gas-electric cars of from 550 to 600 horse power. Mr. Lupton of the Santa Fe stated that his company had just recently placed an order for 21 rail motor cars to be equipped with a 400 horse power plant. He read a description of this equipment. After a brief discussion of the foregoing presentations of Mr. Hummel and Mr. Lupton and the concluding remarks of Chairman Fairbairn the session was adjourned.

Joint Conference With Automotive Industry

54 representatives of 31 companies join delegates on closing day for consideration of mutual problems



A. P. Russell
Chairman, Motor Transport
Division

The final day of the meeting was devoted to the joint conference with representatives of the automotive industry and opened with the address of Division Chairman Russell. He announced that the purpose of the conference was to facilitate a free and open discussion of mutual problems and urged all against any reluctance to express views. The chairman then recognized Mr. Maxwell of the

Pennsylvania who moved the adoption of a resolution to express the sincere thanks of the Division to the Missouri Pacific for the hospitality extended by that road during the meeting. This resolution was adopted along with another, proposed by Mr. Littlefield of the Boston & Maine, to express similar sentiments to E. F. Bisbee, vice-president of the East St. Louis Junction Railroad, who entertained the members when they visited the National Stock Yards.

Resuming his address, Mr. Russell expressed his appreciation of the co-operation which he has received during the time he has headed the division and paid tribute to Secretary G. M. Campbell for the ability with which the latter has handled various problems which arose in connection with the work.

S. A. E. Pledges Co-operation

At the conclusion of his remarks the chairman called upon F. C. Horner of the General Motors Corporation and representatives of the Society of Automotive Engineers, to open the discussion. Mr. Horner stated that the question of the status of the fifth wheel standardization on tractors and semi-trailers had been discussed at length in a recent meeting of the Transportation Committee of the Society of Automotive Engineers. The

outcome of such discussion was the appointment of a sub-committee to investigate the subject. The speaker next pledged the co-operation of the organization which he represented to the railways in their efforts to solve their highway problems and continued to a discussion of the taxes paid by commercial highway carriers and the relation of these to railway taxes.

Mr. Horner was followed by C. M. Easton of the General Motors Truck Company who discussed briefly the sales policies of his company and continued to further comment on the question of standardized trailer equipment. In this latter connection H. E. Yale of the Fruehauf Trailer Company placed his concern on record as expressing a willingness to collaborate with any committee or any other manufacturer in an effort to attain the desired standardization.

E. Dwyer of the Autocar Company raised the question as to the various requirements in vehicle size by the laws of the several states. Chairman Russell replied that this question had been raised several times but added that the Division had not yet developed any comprehensive data on the subject. He continued to cite experiences of the New England Transportation Company with the various requirements of the states through which its motor coaches are operated. He suggested that President Hoover, when Secretary of Commerce, had made some investigation of the subject and thus may continue these investigations.

Proposed Legislation Explained

The Chairman then called upon S. A. Markel, chairman of the legislative committee of the Bus Division of the American Automobile Association, who discussed the questions of regulation and taxation. He outlined briefly the more important provisions of a proposed uniform public utilities act, for all states, which has been drafted by the National Conference of Commissioners of Uniform State Laws and approved by the American Bar Association. Mr. Markel found several objectionable features in the proposed legislation and pointed them out to the gathering.

Asked by Chairman Russell to comment on the proposed legislation for the regulation of interstate motor coaches, the speaker stated it to be his opinion that the proposed Parker Bill more nearly harmonized the views of all interested parties than any bill previously drawn.

He hoped that the House Committee on Interstate and Foreign Commerce would be organized during the special session so that action might be urged on this regulatory question before the December session.

The remainder of Mr. Markel's remarks were in explanation of the provisions of the proposed Parker Bill while he closed with a pledge of his organization's cooperation to the Motor Transport Division.

Mr. Markel was followed by Frank R. Fageol of the Twin Coach Company who addressed the meeting on the subject of "The Retailer, the Wholesaler and the Jobber in Modern Day Transportation." When Chairman Russell received no response to his call for further discussion he adjourned the session with brief closing remarks.

Los Angeles and El Paso Linked by S. P. Coaches

DAILY motor coach service between El Paso, Tex., and Los Angeles, Cal., has been established by the Southern Pacific through its motor coach operating subsidiary, the Southern Pacific Motor Transport Company. The service was so favorably received that it was placed on a daily basis, with one trip in each direction each day, on January 26, 1929. The distance from Los Angeles to El Paso, via Douglas, Ariz., through which the Southern Pacific coaches operate, is 1,000 miles, and the running time is 36 hours.

Other Operations

The Southern Pacific Motor Transport Company is also operating tri-weekly service between Phoenix, Ariz., and Lordsburg, N. M., via the Apache Trail. The length of this route is 281 miles. In addition to these interstate lines, the motor transport company is also operating a daily service within Arizona between Miami, Globe and Duncan, via the Coolidge dam. The length of this run is 135 miles.

The Los Angeles-El Paso route covered by the Southern Pacific motor coaches traverses the states of California, Arizona and New Mexico and enters the state of Texas. It is an interesting route with an unusual variety of adjacent scenery. Passengers on this line are carried through some of the most highly developed agricultural territory in the United States and also through desert country. At Kane Springs, Cal., the highway is 260 ft. below sea level, and at Mule Pass, between Douglas and Bisbee in Arizona, it reaches an altitude of 6,280 ft.

One-third of the highway between Los Angeles and El Paso is paved and the balance has a gravel surface. The road is all in good condition and this affords easy motor coach riding.

The service has been well patronized. Meal stops are made about four hours apart, and rest stops are about two hours apart. Stops are made at Southern Pacific railroad stations, where motor coach tickets are on sale. As an additional convenience, ticket agencies, on a commission basis, are maintained in the business centers of all the towns en route.

Equipment Used

The coaches used by the Southern Pacific Motor Transport Company in its interstate service between Los Angeles and El Paso are Fageol coaches of a specially built parlor type, having seats for 25 passengers. They are powered by a six-cylinder engine, with a 5-in. bore and a 5¾-in. stroke. All of them are equipped with electric fans and are supplied with cold drinking water. The seats are of the reclining type, adjustable to four positions, and are 19½-in. wide. The coaches have dual rear wheels with 40 in. by 9.75 in. tires, and are provided with Westinghouse four-wheel air brakes, an air whistle, and eight dome lights. The coach drivers wear the standard motor transport company uniform, and all of them are men selected for their experience and are under strict discipline.

The coaches used on the Los Angeles-El Paso run are maintained at four points. The principal maintenance plant is at Phoenix, Ariz., with auxiliary maintenance facilities at El Paso, Miami and Los Angeles. The coaches used on the other runs in the southwestern territory are also maintained at these points.



Fageol Parlor-Type Motor Coach Operated by the Southern Pacific Between Los Angeles and El Paso

Pacific Electric Begins Store-Door Collection and Delivery

Motor transport subsidiary co-ordinates truck and train to improve l. c. l. service in southern California

STORE-DOOR collection and delivery service at a number of points on its lines was effected by the Pacific Electric on March 11, when its motor transport subsidiary, the Pacific Electric Motor Transport Company, began operations. The organization of this subsidiary and its purposes were described in the *Motor Transport Section* of November 24, 1928.

In contrast to most store-door delivery plans adopted by railroads or their subsidiaries, which are designed to relieve congested terminals and overcrowded l.c.l. freight stations, the Pacific Electric Motor Transport Company has entered the field for exactly the opposite purpose. Its operation is designed to attract additional traffic, which will provide greater and more efficient use of railroad facilities and forces and of local drayage equipment in the towns served, which are already available but have been used only to a part of their potential capacity.

Many store-door delivery plans inaugurated by other railroads have provided merely a different method of handling business which the railroads already had; that is, trucks have been substituted sometimes in order to permit the elimination of local freight trains. The Pacific Electric Motor Transport Company has a quite different purpose. All of the business which it expects to secure will be new business now moving by motor truck.

The company in its form, organization and status is an express company. It is believed that its operations

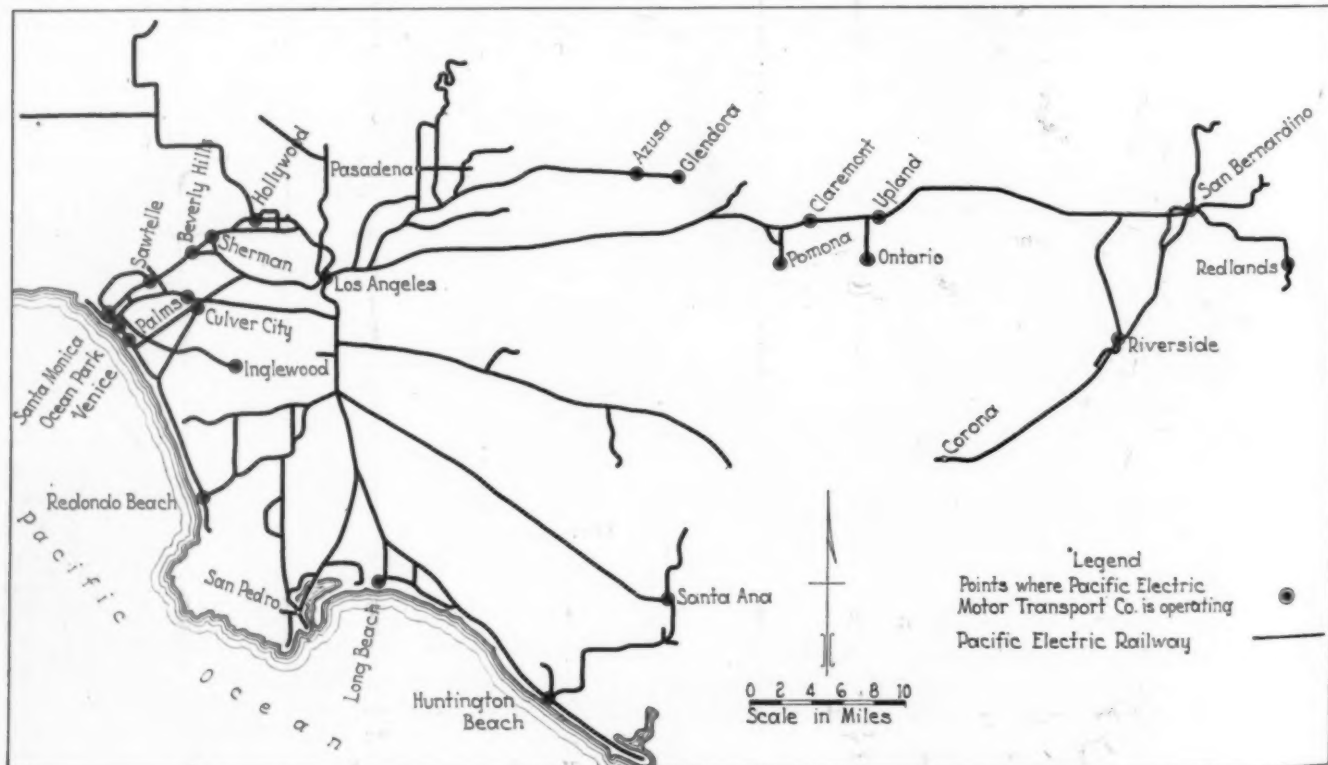
will not have the effect of decreasing the use of motor trucks, but instead will increase such use, and at the same time increase the business of the railway through proper and economic co-ordination of the two means of transportation.

The company is operated completely independent of the Pacific Electric and is in charge of a separate staff of officers. Officers of the Pacific Electric Motor Transport Company are: C. W. Cornell, president; L. B. Young, manager; L. E. St. John, secretary-auditor; J. L. Smale, treasurer. Headquarters are in the Pacific Electric Building at Los Angeles.

Twenty-Four Points Now Served

The initial operation of the motor transport company is between Los Angeles and 23 principal southern California points. There was no reason for the particular selection of the points at which the service was first inaugurated. Negotiations with local draymen were pending at a large number of points, and contracts had been consummated on March 11 with draymen at only the 24 cities. The service of the transport company will be provided at additional stations as rapidly as more contracts are made, until eventually the service will be in effect at practically all stations in southern California on the rails of the Pacific Electric.

For the present at least, the operations will be confined to southern California. This region is thickly dotted with towns and communities, which makes it an ideal



Pacific Electric Lines, and Points at Which New Service is in Effect

place for the inauguration of a service of this kind. The volume of business handled on the first day, March 11, exceeded the amount which had been expected. In the territory ultimately to be served, it is estimated that proper solicitation will secure something in excess of 500,000 tons of l.c.l. freight a year, all of which is now moving by independent motor truck.

The reliability of the Pacific Electric Motor Transport Company is expected to be a large factor in the securing of business. Some shippers have already indicated that the rate charged is not so important in itself as the fact that shippers can depend upon it that the published rate is the rate they will have to pay. Apparently some truck carriers in the territory have not adhered strictly to the rates which they have published, but have bargained for business.

Plan of Operation

The motor transport company publishes rates covering transportation from store-door at the point of origin to the store-door at the point of destination. It issues through billing from store-door to store-door and undertakes in its contract to perform the entire service. At the point of origin, the Pacific Electric Motor Transport Company's trucks pick up shipments at the store-door of the shipper and haul them to the station of the transport company in that community. At the station, the shipments are loaded into the cars of the Pacific Electric Railway and are hauled by rail to the station of destination. At this point they are transferred to the motor trucks of the transport company and delivered to the store-door of the consignee.

This use of the rail cars of the Pacific Electric for the line haul between towns is purely an operating convenience, and so far as the public is concerned, the railroad does not enter into the operation at all. The rail service is performed by the railroad for the transport company under a private contract, at a rate of compensation different from the railway company's published rates. A considerable percentage of the expected business can be absorbed by the railway in its regular rail service without any additional out-of-pocket expense.

The transport company's rates are not based upon rail rates between the same points. They are designed, rather, to meet the competition of motor truck carriers operating in the same territory. In some cases, the transport company's store-door to store-door rates are the same as station to station rail rates. In most cases, however, they are slightly higher, and in one or two isolated cases, to meet a peculiar competitive situation, they are lower than the rail rates.

In addition to the store-door to store-door rates, the transport company publishes rates applying to or from a station; that is, from the station at point of origin to the store-door at point of destination, or from the store-door at point of origin to the station at point of destination. These rates are made to meet similar rates published by other motor truck carriers. In no instance does the transport company publish simple station to station rates.

The transport company has a contract with the Pacific Electric Railway under which the former makes use of the railway company's freight stations at various points, and also of the railway company's station employees, the transport company participating in the salaries of such employees and paying rent for the use of the facilities.

Operating Practices

When the transport company's operation was first conceived, it was expected that it might purchase and

operate its own trucks in most of the towns served. However, before doing so, the local drayman in each town and also the interurban motor truck carriers were given an opportunity to bid for a contract to carry on the local pick-up and delivery service for the transport company. It has developed that the transport company has not been obliged to invest in any motor truck equipment, and all of the work is being done under contracts with local draymen.

These draymen, after having the situation explained to them, were made to realize that they could not expect to make as much out of the handling of the transport company's business as they might out of their ordinary local transfer work. However, they are able to do the transport company's work at a lower charge

HANG ME UP!

FAST EXPRESS-FREIGHT SERVICE
From STOREDOOR to STOREDOOR
 Between
LOS ANGELES
 and

AZUSA BEVERLY HILLS CLAREMONT CULVER CITY GLENDORA HOLLYWOOD HUNTINGTON BEACH INGLEWOOD LONG BEACH OCEAN PARK ONTARIO	PALMS POMONA REDLANDS REDONDO BEACH RIVERSIDE SAN BERNARDINO SANTA ANA SANTA MONICA SAWTELLE UPLAND VENICE
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WEST HOLLYWOOD

Additional points will be added from time to time.

Effective MARCH 11, 1928, the PACIFIC ELECTRIC MOTOR TRANSPORT COMPANY will operate a modern, fast and dependable Freight-Express Service between the points named above. On calls received up to 3 p. m. shipments will be picked up and delivered to consignee on following business morning.

For pick-up service or rate quotations call TRINITY 2431.

For full information call any Pacific Electric Railway Company agent (who are joint agents for Pacific Electric Motor Transport Company) or TRAFFIC DEPARTMENT, 624 Pacific Electric Building. METropolitan 7400.

PACIFIC ELECTRIC MOTOR TRANSPORT CO.

701 Pacific Electric Building L. E. YOUNG, Manager Los Angeles. MEtro. 7400

Advertisement of Beginning of New Store-Door Service

because of the volume of business, and because it can be looked upon as additional business which can largely be absorbed by the existing equipment and personnel at a minimum of added expense.

The general impression is that it is the practice of interurban motor truck carriers to pick up shipments at store-doors until they secure a full truck load of freight, and then to operate the truck directly to the destination point. However, this is not the practice, as most truck carriers pick up shipments in a small truck, haul the freight to a central station, and transfer it from the small truck across the platform into a larger truck, which makes the line haul. At the point of destination the truck carrier transfers the shipment again from the large truck to a smaller truck for the completion of the delivery. In other words, the practice of the truck carriers is the same as that of the transport company, except that the latter will make use of railway

cars instead of motor trucks for the line haul between towns served.

Billing Document

Uniform bills of lading are used as a general rule. Certain large shippers, however, make use of a private form of shipping order. The transport company uses a billing document consisting of eight parts, the entire document being made out by the agent at the point of origin. One part of the billing document is the freight express bill, referred to as the expense bill. Inasmuch as the document is made out by the forwarding agent, the expense bill is ready to go with the truck driver who makes the delivery to the consignee's store-door. If the charge is to be collected on delivery, or if the consignee is a stranger to the agent at the point of destination, the truck driver is expected to make the collection. Regular customers, however, are given credit and the transport company's agent collects the charges from them.

Los Angeles, of course, is the distributing point, and most of the movement is from Los Angeles to suburban towns. There is very little movement from such towns into Los Angeles. At Los Angeles, the contractor who is performing the pick-up and delivery service for the transport company is the Signal Trucking Service, an organization which is engaged in an identical service for various interurban motor truck carriers.

In Los Angeles, there is only one pick-up and delivery zone, which is defined in the tariff, and within which the transport company holds itself ready to pick up or deliver freight. If any shipment originates in or is destined to territory outside of this zone, the drayage company which is under contract to perform the work for the transport company in Los Angeles, goes beyond the zone to handle such shipments; but in doing so, the agent is acting purely in a private capacity, and the haul beyond the transport company's zone is a private arrangement between the drayman and the owner of the freight. The transport company's responsibility begins or ends at the boundary line only.

In Los Angeles, the transport company does not guarantee to pick up any shipment for which a call is received after 3 P.M., but it does offer to pick up on such calls if a truck is available, or if it is practicable to do so. The actual pick-up work continues until as late as 5:30 P.M., many shippers not permitting pick-ups before 5 o'clock. The operation is very rapid, and the shipments picked up at 5:30 are, in most cases, loaded in cars with the billing completed, by 6:15 P.M.

The time of picking up shipments in the smaller towns is not important so long as they are secured in time to catch the transport company's service from the town. In Los Angeles, however, the situation is different. The large shippers value their floor space and want their shipments picked up as soon as they are ready. For this reason, the transport company's arrangement with the contractor in Los Angeles requires him to pick up shipments as quickly as possible and not later than two hours after a call is received. Similarly, all contracts require the contractors to deliver shipments as quickly as possible, but not later than two hours after notification that the shipments are on hand at the station for delivery to the consignees. As a practical matter, notification is not actually given, because shipments arrive at the various stations at a different time each day and the contractor knows he is expected to have a truck immediately available.

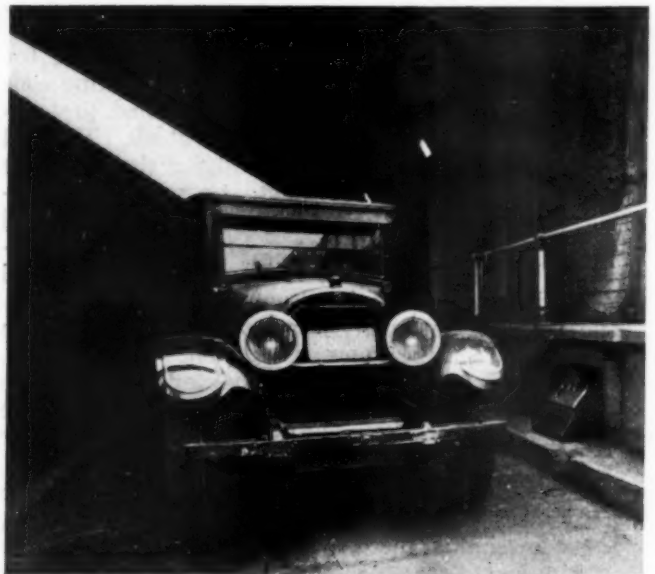
In most of the small communities, the pick-up and

delivery zone ends at the city limits, but in certain others, the zone is circumscribed because the city boundaries extend to considerable distances. It is neither necessary nor practicable to serve such large zones.

Practically all of the points at which the transport company is operating are close enough to Los Angeles so that shipments originating in Los Angeles one day are delivered to the store-door of the consignee at the opening of business the following morning. Consideration is also being given to a noon service. To most of the closer points, under which plan, shipments collected in the morning and departing from Los Angeles by train at noon, and arriving at most points of destination not later than 2 P.M., will be delivered the same afternoon.

Traffic Counting Device

AN adaptation of the photo-electric cell is now being used for counting traffic in one of the Holland vehicular tunnels which extend under the Hudson river between New York, N. Y., and Jersey City, N. J. The experimental unit is located at the exit end of one of the tunnels. The apparatus, of General Electric manufacture, consists of a small concentrated beam lighting reflector mounted in an inclined position on the overhead iron work of the tunnel, its beam of light fall-



The Passing Car Cuts Off the Beam of Light From the Receiver Shown at the Right

ing upon a small circular window in a box placed beneath the sidewalk at the opposite side of the roadway. The box contains a photo-electric tube, an amplifying tube and an electric relay.

Each time a vehicle passes the spot, a beam of light falling upon the photo-electric tube through the little window, is interrupted. This effects the electrical circuit so as to operate the relay, which in turn energizes a transmission circuit and operates a counter located in an office of the administration building some distance away. If successful, it is expected that such devices can be used not only to count traffic, but by using one at either end, to indicate congestion or a tie-up in the tunnel.



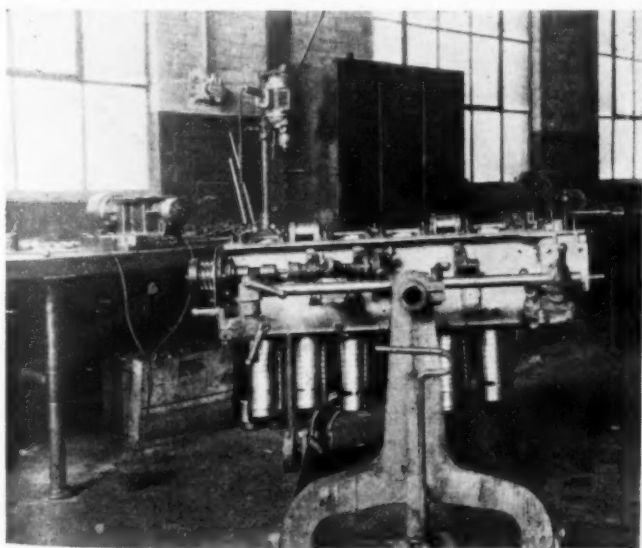
Exterior View of the Worcester Garage Showing the Skylights

Modern Garage Houses Fifty Motor Coaches

Worcester Consolidated, a New Haven property, has developed a maintenance system which includes unusual features

SEVERAL years ago it became apparent that the Worcester Consolidated Street Railway Company of Worcester, Mass., could be placed upon a more efficient basis provided adequate expenditures were made to improve its facilities. The company operated then, as it does now, both electric railway lines and motor coaches. In general the suburban rail lines were losing money, due mainly to the competition of private automobiles, and it was felt that the substitution of motor coaches for some of these lines would regain for the company some of this lost traffic.

The New York, New Haven & Hartford, in seeking authority to control the Worcester Consolidated—which it was permitted to do under an act of the Massachusetts Legislature if at least 75 per cent of the municipalities served by this company approved—promised that the property would be rehabilitated and that something over one million dollars would be expended to this end.



A Sleeve-Valve Motor Being Overhauled

Since this improvement contemplated the substitution of motor coaches for several suburban trolley lines, the enlargement of motor coach facilities became necessary and a modern garage, costing \$120,000, was built. The result of these expenditures has been a great improvement in service to the public and a large part of this improved service has been made possible by the provision of modern facilities for the upkeep of motor coaches.

Construction of the Garage

The new garage has been made as nearly fireproof as possible through the use of a steel framework enclosed in buff brick and glass. The one-story brick building is erected on 84 piles. Beneath the truss roof is an unobstructed floor area 159 ft. long and 105 ft. wide which provides ample room for the storage and maneuvering of 50 large motor coaches. A feature of the roof construction is that nearly all of its surface is built of glass skylights for the purpose of furnishing ample light for the mechanics. The roof is of the Gypsum poured-in-place type and is waterproofed with Johns-Manville asbestos built-up roofing. The Gypsum curbs around the skylights are 15 in. above the finished roof slab.

The skylight framing is constructed with U-shaped, one-piece rolled-steel bars, with 16-oz. copper caps and curb aprons. They are equipped with a continuous ventilator for the full length of the skylight. Flat Transite asbestos board $\frac{1}{4}$ in. in thickness is placed between the skylight eaves and the Gypsum curbs. The window sash is made of steel frames which are arranged in units with ventilating and fixed sections. Such ventilating sections as cannot be reached from the floor are provided with operating chains and catches.

Two motor-operated vertical steel doors are located at each end of the garage. These doors are 14 ft. high and 12 ft. wide, permitting the entry of the largest motor coach in service. Each of the four main doors is operated by a $1\frac{1}{2}$ -hp. electric motor with push-button control. The small doors are made of wood covered with metal. The concrete floor slopes from the side walls toward the center and outward each side of the floor center line, which causes water to drain into eight floor

drains equidistantly spaced on either side of the floor center line.

The north side of the shop includes the depressed pit area, the machine shop, battery room, storeroom and office. The depressed floor area is of particular interest. The laws of Massachusetts forbid the use of the conventional type of repair pit. In order to comply with the law, a concrete depressed area 4 ft. 6 in. deep was built into the floor. Four pairs of channel iron treadways are built over this area, which forms four openings over which coaches are placed. The remainder of the open surface above the depressed area is covered with Irving subway grating. This construction provides a depressed floor area 41 ft. wide by 60 ft. long which is entirely open above and which permits the escape of exhaust gases. A cat walk with an iron railing extends across the front of the depressed area 18" above the level of the main floor.

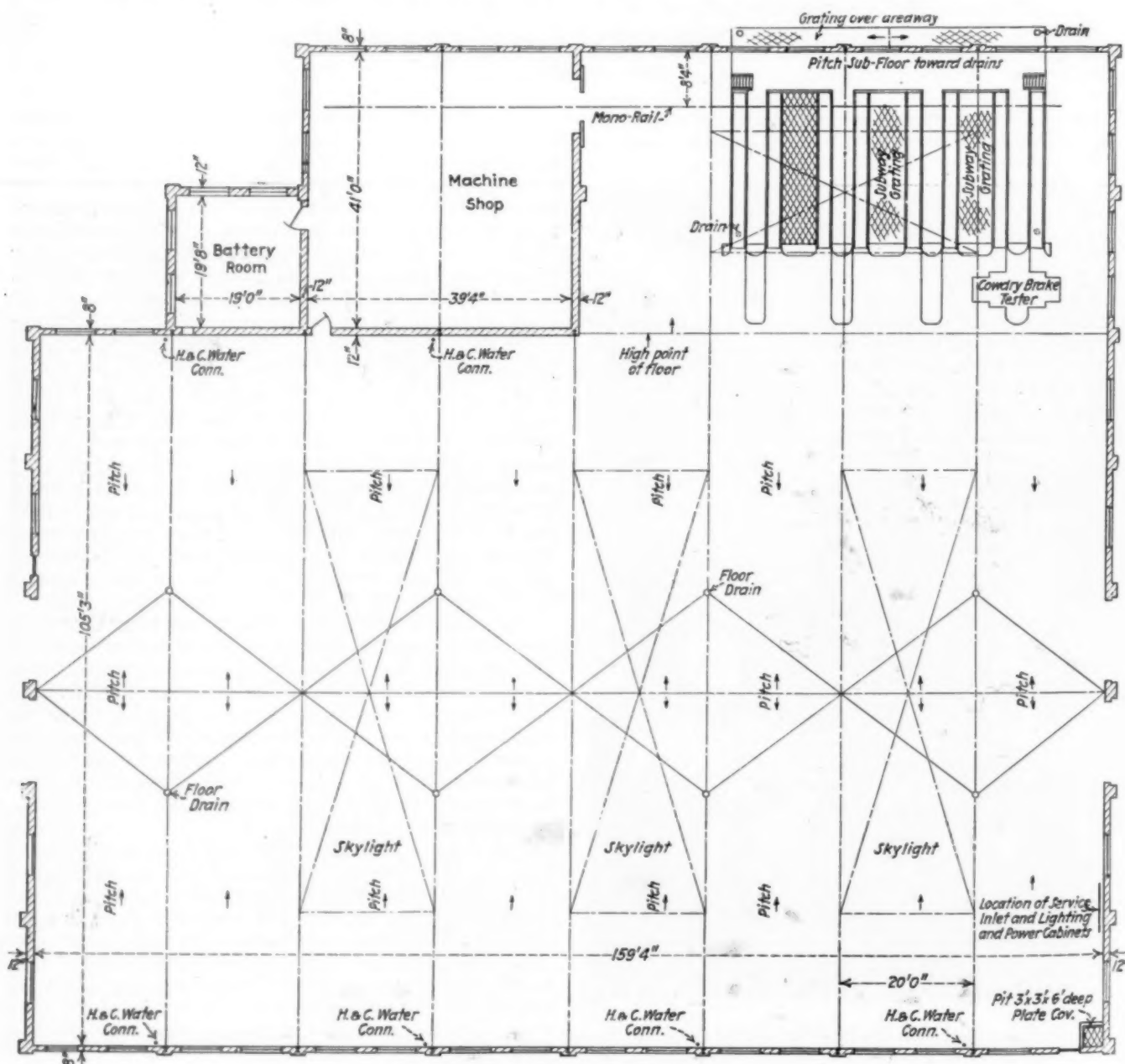
A two-ton Shepard electric hoist is mounted on an overhead monorail that extends over the depressed area to the far end of the machine shop.

A hot-and-cold water system extends around the

garage, with drops at the columns as indicated in the floor plan illustrated. These drops are yoked together and provided with valves to control the temperature of the water. The outlets are equipped with $\frac{3}{4}$ -in. hose connections for washing coaches. The garage is also equipped with a sprinkler system and a compressed air line. The main part of the building is heated with Buffalo unit heaters mounted on substantial steel supports located above the bottom chord of the roof trusses. The machine shop and depressed floor area are heated by wall radiators. Steam heat, hot and cold water and compressed air are furnished from the new electric railway car barn located approximately 160 ft. from the garage.

Lighting Arrangement

RLM dome reflectors are used exclusively for all overhead lights. The garage proper is equipped with forty 200-watt overhead lighting units in eight branch circuits, with five lights on each circuit. The bottom of these fixtures extend to the bottom chord of the roof trusses. This system provides eight rows of five lights each in the eight bays between the roof trusses.

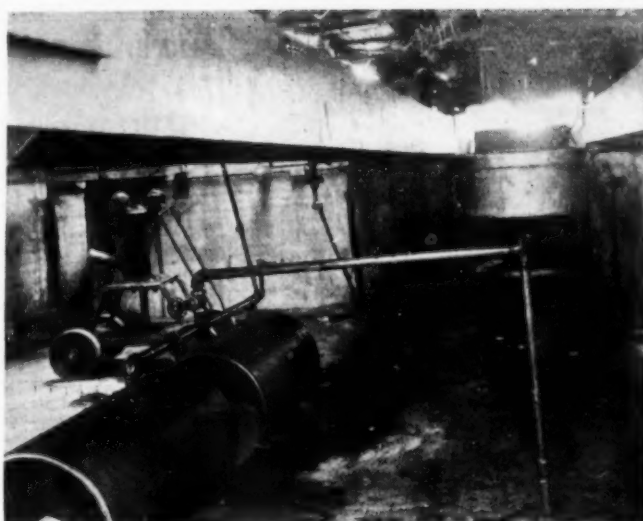


Floor Plan of the Worcester Garage

Eight 200-watt lighting units, with conduit drops in two circuits, are located over the depressed area. In the machine shop there are nine 200-watt lights and conduit drops on one branch circuit, controlled by two local push-button switches. The depressed area is furnished with ten 75-watt, wall-bracket lights located $3\frac{1}{2}$ ft. from the floor of this area. A 200-watt elliptical angle reflector is located about 16 ft. from the ground outside of the building on each side of the main doorways. Six plug receptacles are located, one on each side of the main doorway and one on each side of the two columns between the main garage and the repair shop. Eight plug receptacles are equally distributed around the machine shop about 4 ft. from the floor. Also eight receptacles are distributed around the walls of the depressed area about $3\frac{1}{2}$ ft. from the floor.

Method of Handling Lubricants

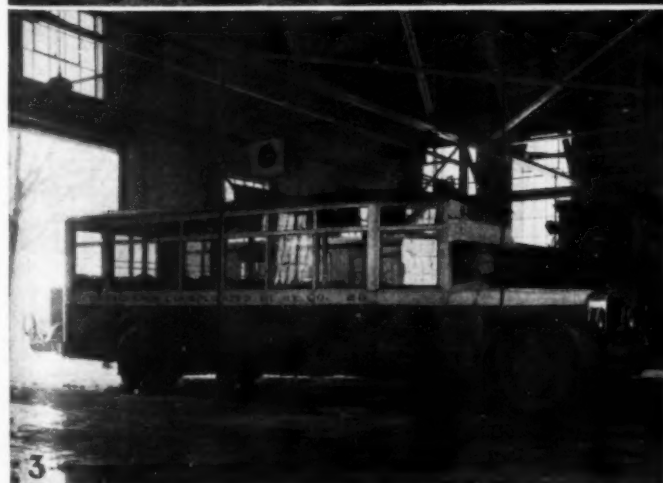
An ingenious shop-made system for handling lubricants has been installed for the purpose of eliminating the handling of oils or greases in open buckets or other containers. The crank-case oil is changed every 5,000 miles for coaches equipped with oil filters and every 2,000 miles for cars without this device. One of the illustrations shows crank-case oil being drained into a funnel, from the bottom of which a pipe leads into two storage tanks as shown. When these tanks are full, 50 lb. of air pressure is admitted to the tanks, which forces the oil into the Refineroil storage tank shown in another illustration. The oil is passed through a reclaiming process, after which it is forced into the oil storage



Method of Draining Crankcase Oil into Storage Tanks from Which It Is Forced by Air Pressure into the Oil Reclaiming Machine

tanks located nearby. About 80 per cent of all crank-case oil is reclaimed and put back into service.

Transmissions and differentials are also filled through the medium of compressed air. The change of oil is made every 15,000 miles. A drum of lubricant is placed in the top section of a welded angle-iron rack. The contents of the drum are drained into a reservoir located



1—Depressed Area Showing One of the Pits with the Subway Grating Between Them; 2—A Motor Coach on the Cowdrey Brake Testing Machine; 3—Where Coaches Receive Gasoline and Water; 4—South Side of the Garage Where the Coaches are Stored and Cleaned

Defective Coach Service Report Made Out for Each 24 Hr. Period

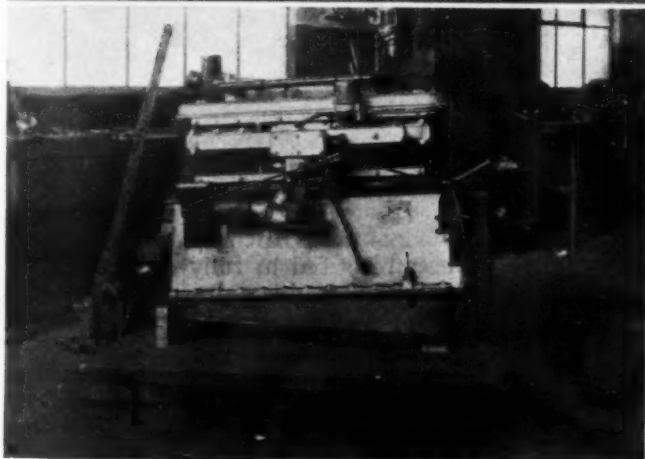
Spring shackle bolt nuts are often difficult to remove because of corrosion. This difficult job has been made easy by the use of a Thor pneumatic close-quarter wrench. As the depressed area is piped throughout with compressed air, the wrench can be quickly connected to the line and the tight nuts loosened in one third the time than formerly required by the use of hand wrenches.

No large machine tools have been installed in this

Form E 250 Motor Coach Inspection Record Which Gives a Complete Picture as to the Condition of the Unit

garage because all machine work is sent either to the main shops of the street railways department. For this reason the repair shop contains only such tools as a Wardell line reamer, a piston turning and grinding machine, and other similar small tools common to a garage repair shop.

Equipment for cleaning motors and parts consists of a McKee cleaning machine and is located in one corner of the repair shop. It consists of a gas-fired automatic steam boiler which supplies steam to the tank in which the Oakite cleaning solution is contained. The parts to be cleaned are placed on the stand shown in one of the illustrations. The hot cleaning solution is sprayed with steam pressure over the parts. The excess solution

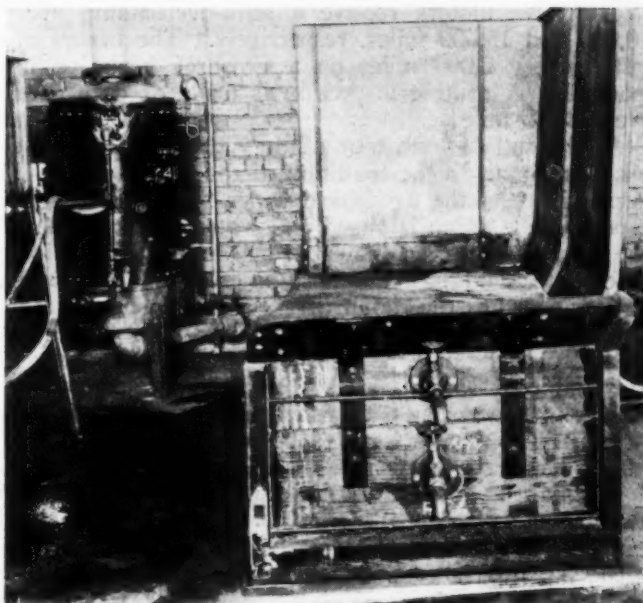


The Hydraulic Lift Truck at the Top Has Lifted the Motor From the Floor Shown on the Bottom View

drains into a reservoir, from which it can be drained off through the spigots shown in the illustration.

The battery repair room is entered from the west side of the repair room. It contains a 150-amp., 12-volt constant potential output battery-charging outfit, to which 16 batteries can be connected for charging. Batteries are emptied, flushed out and refilled with new electrolyte, but at the present time none is rebuilt. As a result of considerable trouble experienced with the handles pulling out of battery boxes, a new type of box is being built. A 2½-in. wide by ⅛-in. thick piece of strap iron fits snugly around three sides of the box. A handle is welded to each end of the strap. Thus the weight of the battery is supported by the strap and not by two handles set into the wooden edges of the box. An electrical test bench completes the equipment necessary for electrical repairs.

The skid-platform and lift-truck system is used for



Equipment Used for Cleaning Engines and Parts

hauling heavy material about the garage: A National hydraulic lift truck is used. A motor, as shown in one of the illustrations, is placed on the skid platform and then the lift truck is pushed under and the platform with its load is raised from the ground by pulling the handle down to a horizontal position. The raised platform of the truck with its load is locked in position. The truck with its load can be moved to any position in the garage and the skid platform lowered to the ground by pressing a foot release lever. One man can move without trouble the motor shown in the illustration.

In all 64 motor coaches and 17 street railway service trucks are maintained in this garage. Inspection and repairs are made on a mileage basis. Valve tappet and



View Across Depressed Area Showing Cat Walk and Overhead Mono-rail

sleeve valve motors receive a semi-overhauling every 10,000 and 15,000 miles, respectively. The brakes are tested every 2,000 miles on a Cowdrey brake testing machine. A routine inspection is made of each coach every 2,000 miles.

At the end of each tour of duty the operator makes out a report as to the condition of the coach. This slip is placed under the windshield wiper. If no defects are reported, the coach is gased and watered just inside of the west entrance, as shown in one of the illustrations. The water and gasoline hose lines extend from the bottom chord of the roof trusses. Air pressure forces a gasoline flow at the rate of 30 gal. per min. The coach is then placed along the south side of the garage where hot and cold water outlets for washing purposes are located. The coaches are washed only when they require it. If repairs have to be made, the coaches are placed along the north side of the garage.

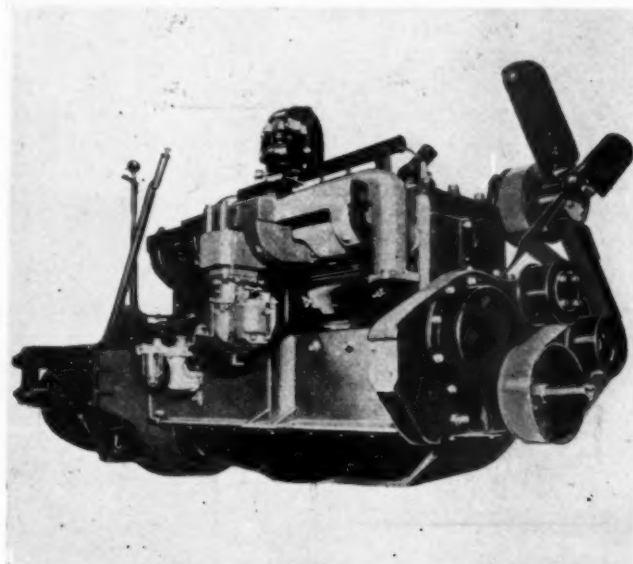
The defects noted by the operators are listed daily on two forms which are illustrated. The defects are listed on the 24-hour defective coach service report which is made out in triplicate, one of which is retained by the garage foreman, the remaining two being sent, one to the master mechanic and the other to the general manager. The defects are also listed on the back of Form E250 across the top of which are 31 column headings which represent days of the month. Down the left side is listed a limited number of defects which read as follows: Damaged body, broken glass, generator, battery, starting motor, buzzer system, lights—interior, front and rear, front axle, service and emergency brakes, steering gear, radiator, speedometer, horn or whistle, fenders, spark plugs, ignition and clutch.

At the semi-overhauling period Form E250 is taken by the inspector who studies the defects listed on the back as a guide as to what to look for particularly. After each item listed on the front side of this form is noted the condition of the part. During the inspection the engine is torn down and all parts examined. Any part that is not good for 15,000 miles of additional service is either repaired or replaced. The valves are re-ground, the bearings checked, the piston rings examined—in fact the unit is completely reconditioned for 15,000 miles additional service. At the completion of the semi-overhaul inspection, Form E250, filled out, is filed away until the general overhaul period.

At the general overhauling period every part that is worn is replaced. A completely repaired motor, differential and transmission are put in the coach. The body is spray-painted with lacquer. The unit is then good for either 50,000 or 100,000 miles of service, depending on the type of motor in the unit.

Studebaker Straight-Eight Motor Coach Chassis

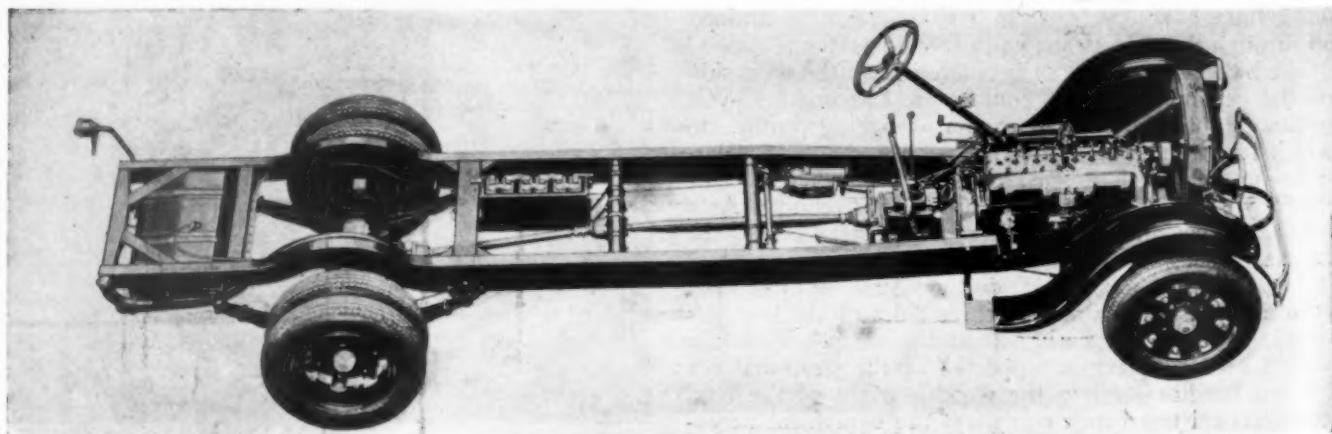
THE Studebaker Corporation of America, South Bend, Ind., is now in production on a motor-coach chassis designed for a straight-eight engine. The coaches are available in either a 158-in. or 184-in. wheelbase and in three types. Some of the more important features of the coaches include a 115-hp. straight-eight engine which is fundamentally the same as the one used in the President straight-eight, except that it possesses additional refinements, which gives it greater stamina and performance. The engine is provided with dual carburetion, which in effect gives two



The 115-hp. Eight-Cylinder Studebaker Engine

carburetors and two manifolds, each feeding four cylinders. The gas mixture is fed to fully machined combustion chambers through a down-draft duplex manifold. The over-size generator, water pump and starter are arranged to make servicing easy. A 21-in. fan is driven by a 2-in. belt, which also drives the generator and water pump. The fan-belt adjustment is part of the U-shaped support bracket. The fan revolves on two ball bearings which are widely separated to insure proper balance.

Other features are a semi-automatic choke and



The Studebaker Motor-Coach Chassis—Designed for an Eight-Cylinder Engine

weather-proof ignition. Three- or four-speed transmissions are optional.

Extra Factors of Safety

The chassis is unusually strong and provides extra factors of safety and strength throughout without sacrificing riding comfort. On the 184-in. special and heavy-duty chassis, there are two tubular cross members and five pressed-steel cross members. On the 158-in. Junior chassis, there is one tubular cross member and five pressed-steel cross members. The frame is made of pressed steel. Its maximum section is 8 1/16 in. in height by 7/32 in. thick, and the flanges are 3 in. wide.

Heavy and wide springs carried in extra heavy shackles with big spring bolts are an important contribution to riding comfort. The rear springs are 56 3/8 in. long and 3 in. wide and the front springs are 38 in. long and 2 1/2 in. wide. They are of the semi-elliptic type and are manufactured according to Studebaker formulas. Large U-bolts securely fasten the heavy springs to the rear axle.


Westinghouse Brakes

A feature of the braking system is the use of Westinghouse vacuum brakes as a unit in the four-wheel brake system. Operating as a unit, the brakes require only 1/3 the normal pedal pressure to operate. This reduced pedal pressure is especially desirable in service of the street-car type, as well as on intercity routes, because it materially reduces the physical energy required for full braking efficiency.

* * *

REDWOOD EMPIRE TOUR

BY RAIL AND MOTOR COACH



Southern Pacific

Reproduction of Display Poster Used by Southern Pacific to Advertise its Co-ordinated Train and Motor Coach Tours

Motor Transport News

THE TEXAS RAILROAD COMMISSION on March 8 held a hearing on the application of the Southwestern Transportation Company to purchase the motor coach line of John Baker, between Fort Worth, Tex., and Grapevine.

THE MISSOURI PACIFIC TRANSPORTATION COMPANY has applied to the Texas railroad commission for permission to operate a motor coach line between Navasota, Tex., and Crockett. A hearing on the application was held on March 8.

THE ILLINOIS COMMERCE COMMISSION held a hearing on February 27 on the application of the Alton Transportation Company, a subsidiary of the Chicago & Alton, to operate motor coaches between Joliet, Ill., and Carlinville, via Springfield, and between Dwight and Streator.

THE RICHMOND, FREDERICKSBURG & POTOMAC, on March 7, inaugurated motor coach service between Richmond, Va., and Washington, D. C. Four A. C. F. motor coaches were installed as the initial equipment and each will make one round trip daily.

THE READING TRANSPORTATION COMPANY, on February 28, inaugurated interstate motor coach service between Philadelphia and Atlantic City. The company has also applied to the Public Service Commission of Pennsylvania for a certificate to operate between Philadelphia and Pottsville.

THE MISSOURI PUBLIC SERVICE COMMISSION has approved the sale of the Capitol State Line, operating between Kansas City, Mo., Jefferson City and St. Louis, to the Missouri Pacific Transportation Company. The Missouri Pacific is reported to have announced that there will be no change in the present fare schedule.

THE BURLINGTON TRANSPORTATION COMPANY, a subsidiary of the Chicago Burlington & Quincy, has been granted incorporation papers in Missouri as a foreign corporation. The plans of this company for extensive motor coach operation, supplementing the rail service of the Burlington, were reported in the Motor Transport Section of February 23.

THE BURLINGTON TRANSPORTATION COMPANY, newly organized motor coach operating subsidiary of the Chicago Burlington & Quincy, has filed an application with the Illinois Commerce Commission for authority to operate motor coaches between Galesburg, Ill., and the point west of Quincy where federal highway No. 24 intersects the Illinois-Missouri state line.

THE MISSOURI PACIFIC TRANSPORTATION COMPANY and the Southwestern Transportation Company, subsidiaries respectively of the Missouri Pacific and the St. Louis Southwestern, opened a joint motor coach terminal at Little Rock, Ark., on February 13. The Missouri Pacific has plans for the establishment of a garage with storage and maintenance facilities at Little Rock.

S. P. to Open New Highway Line

Permission to operate motor coaches for the transportation of passengers, mail and express between Gilroy, Cal., and Tres Pinos has been granted to the Southern Pacific Motor Transport Company by the Railroad Commission of California. The plan is to substitute three round trips by motor coach daily for the present two mixed train schedules operated by the Southern Pacific. In addition to the regular stops on the line between Gilroy and Tres Pinos, service will be given to and from the Fairhaven school, which is off the main line. The motor coach schedule will be arranged to make close connections at Gilroy with Southern Pacific main line trains northbound and southbound.

The two mixed trains now operated by the Southern Pacific leave Gilroy at 10:45 A.M. and 12:55 P.M., and depart from Tres Pinos at 7:30 A.M. and 12:30 P.M. Under the proposed

motor coach schedule, the coaches will depart from Gilroy daily at 9:55 A.M., 4:55 P.M., and 8:38 P.M., and will leave Tres Pinos in the opposite direction at 7:20 A.M., 1:55 P.M., and 7:10 P.M.

Operation of Denver & Interurban

The operation of the motor coach line of the Denver & Interurban Transportation Company, a subsidiary of the Colorado & Southern, between Denver, Col., and Boulder was taken over by the Rocky Mountain Parks Transportation Company on March 1 for a trial period. There has been no sale nor merger of the property, and the present schedule of 13 round trips daily between Denver and Boulder will be maintained. The only change is that the equipment, while still owned by the Colorado & Southern, is now being operated by the Rocky Mountain Parks Transportation Company.

Motor Truck Show Plans Altered

Plans for the holding of a national motor truck show later this year have been altered by the truck manufacturing members of the National Automobile Chamber of Commerce, in favor of a program of demonstration of the uses of motor trucks in various types of transportation work. This decision was reached at a meeting of the truck members of the National Automobile Chamber of Commerce held in Detroit, Mich., on March 6. The motor truck committee of the chamber was asked to consider the advisability of a motor truck week throughout the United States, which would include special exhibits by all dealers, with demonstration tests for brake performance, hill climbing and acceleration.

Orders for Equipment

THE SOUTHWESTERN TRANSPORTATION COMPANY has accepted delivery of a White Model 53 motor coach.

THE READING TRANSPORTATION COMPANY has accepted delivery on two Mack six-cylinder Model BK motor coaches.

THE SOUTHERN PACIFIC MOTOR TRANSPORT COMPANY has accepted delivery of 12 six-cylinder Fageol motor coaches of the parlor type.

THE SOUTHWESTERN TRANSPORTATION COMPANY has ordered four Model 51A 2½-ton trucks and five Model 58 3-ton trucks from the White Company, Cleveland.

THE MISSOURI PACIFIC TRANSPORTATION COMPANY has ordered a 21-passenger motor coach from the Studebaker Corporation of America, South Bend, Ind.

THE LOS ANGELES & SALT LAKE has accepted delivery of one Type Y Yellow coach of the parlor type, from the General Motors Truck Company, Pontiac, Mich.

THE SOUTHWESTERN TRANSPORTATION COMPANY has accepted delivery of three Type W Yellow coaches from the General Motors Truck Company.

THE SANTA FE TRANSPORTATION COMPANY, Santa Fe, N. M., has received five Type W Yellow coaches of the parlor type from the General Motors Truck Company.

THE UNION PACIFIC STAGES has accepted delivery of one six-cylinder Fageol parlor type motor coach, one Model 54 six-cylinder White motor coach and one 29-passenger parlor type A.C.F. motor coach.

Mo. P. Motor Coach Orders

Initial orders for equipment placed by the Missouri Pacific Transportation Company call for 20 motor coaches, to cost approximately \$175,000. Orders have been placed for 2 motor coaches from the White Company, 4 from the American Car

& Foundry Motors Company, 5 from the Reo Motor Car Company and 9 from the General Motors Truck Company. All of these coaches are of the parlor type, and will have seats for 21 to 25 passengers. Sixteen of them are to be equipped with special inside baggage racks. The equipment is to be painted maroon, with silver trimmings, and with the insignia of the company in red. The first of these motor coaches have already been delivered, and the last will be received before April 1.

Motor Transport Officers

G. W. Marriott has been appointed assistant to the vice-president and general manager of the Missouri Pacific Transportation Company, with headquarters at St. Louis, Mo.

The Pacific Electric Motor Transport Company with headquarters at Los Angeles, Cal., has elected the following officers: President, C. W. Cornell; manager, L. B. Young; secretary-auditor, L. E. St. John; treasurer, J. L. Smale.

Joseph Z. Terrell has been appointed manager of the West Virginia Transportation Company, with headquarters at Clarksburg, W. Va. Mr. Terrell was born at Beaverdam, Va., in December, 1873. He was educated in the schools of that city and entered railroad service as a telegrapher for the Chesapeake & Ohio in January, 1890. He served in a similar capacity on the Atlantic Coast Line in September, 1891, remaining with that road until May, 1892, when he entered the service of the Seaboard Air Line. He was telegrapher and station agent for the Baltimore & Ohio for twenty years, until October, 1918, when he was appointed to the post of warden of the State Penitentiary at



Joseph Z. Terrell

Moundsville, W. Va. Mr. Terrell served in the latter capacity until June 1, 1923, when he became executive head of the Parkersburg Finance Corporation, at Parkersburg, W. Va. In May, 1926, the business of this firm was discontinued and Mr. Terrell became employment manager of the Viscose Company at Parkersburg, in which capacity he served until his recent appointment as manager of the West Virginia Transportation Company.

Trade Publications

ELECTRICAL EQUIPMENT.—The North East Electric Company, Rochester, N. Y., has issued a new edition of its bus catalog, 100-B. This catalog lists its complete line of heavy duty generators, starting motors, ignition, control units, horns and speedometers.

BOHNALITE.—A booklet has been issued by the Bohn Aluminum & Brass Corporation, Detroit, Mich., in which is described Bohnalite, a metal which is said to be 60 per cent lighter than iron, but to possess all of the advantages of the heavier metal. The booklet contains much valuable data, not only of a general descriptive nature, but specific information covering the physical properties of each Bohnalite alloy is carefully detailed. The utilization of Bohnalite in the automotive industry is described in detail.